Commencement Number.

NEW ENGLANDER

AND

YALE REVIEW.

No. CCLVI.

AUGUST, 1891.

ARTICLE I.—PROTECTION TO PRIVATE PROPERTY FROM PUBLIC ATTACK.

An Address delivered before the Graduating Classes at the Sixty-seventh Anniversary of Yale Law School, on June 23, 1891, by Hon. D. J. BREWER, LL.D., Justice of the Supreme Court of the United States.

Mr. President and Gentlemen of the Graduating Classes:

"WE hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the pursuit of Happiness." This was the natal cry of a new nation. It is the illuminating and interpreting voice of the Constitution. I know it is by some thought clever to speak of the Declaration as a collection of glittering generalities. The inspired apostle said: "And now abideth faith, hope, charity—these three; but the greatest of these is charity." This affirmation is only a glittering generality; but subtract from Christianity all that it implies, and what is left is as barren as the sands of Sahara. The Declaration passes beyond

the domain of logic—it argues nothing. It appeals to the intuitions of every true man, and relying thereon, declares the conditions upon which all human government, to endure, must be founded.

John Adams was a member of the committee which drafted this Declaration, and in 1780, he prepared the Bill of Rights for the new Constitution of the State of Massachusetts. Its first article is in these words: "All men are born free and equal, and have certain natural, essential, and unalienable rights; among which may be reckoned the right of enjoying and defending their lives and liberties; that of acquiring, possessing, and protecting property; in fine, that of seeking and obtaining their safety and happiness." There is no additional truth in this article. Its last clauses simply define what is embraced in the phrase—"the pursuit of happiness." They equally affirm that sacredness of life, of liberty, and of property, are rights—unalienable rights; anteceding human government, and its only sure foundation; given not by man to man, but granted by the Almighty to every one; something which he has by virtue of his manhood, which he may not surrender, and of which he cannot be deprived.

In the Constitution, as originally adopted, there was no reaffirmation of these fundamental truths. Why this omission? The men who had joined in the Declaration of Independence were the framers of the Constitution. In the lapse of years had they grown wiser? Were they repudiating that Declaration, or were they still filled with its spirit? While putting into the cold phraseology of the Constitution the grants and limitations of governmental power, did they forget or repudiate the truths which only eleven years before they had affirmed to be self-evident? I shall not stop to argue before you that the Constitution was no departure from the Declaration. On the contrary, I assert and appeal to history in support of the truth thereof—that the spirit of 1776 was present with and filled the convention of 1787, and that the corner-stone of the foundation upon which the Constitution was built, and upon which it rests to-day, was and is the Declaration of Independence. I read into the one the affirmation of the other, that some truths are self-evident, existing before and superior to constitutions,

and, therefore, unnecessary of mention therein. Life, liberty, and the pursuit of happiness are lifted beyond the touch of any statute or organic instrument. From the time in earliest records, when Eve took loving possession of even the forbidden apple, the idea of property and the sacredness of the right of its possession has never departed from the race. Whatever dreams may exist of an ideal human nature, which cares nothing for possession and looks only to labor for the good of others—actual human experience, from the dawn of history to the present hour, declares that the love of acquirement, mingled with the joy of possession, is the real stimulus to human activity. When, among the affirmations of the Declaration of Independence, it is asserted that the pursuit of happiness is one of the unalienable rights, it is meant that the acquisition, possession, and enjoyment of property are matters which human government cannot forbid, and which it cannot destroy; that except in punishment for crime no man's property, nor any value thereof, can be taken from him without just compensation. Instead of saying that all private property is held at the mercy and judgment of the public, it is a higher truth, that all rights of the State in the property of the individual are at the expense of the public. I know that, as punishment for crime, the State may rightfully take the property of the wrongdoer. Fine and confiscation have been always recognized as suitable means of punishment. The object of punishment, as well as its justification, is to protect society and deter from crimes against it. The public must use the best means therefor—death, imprisonment, stripes, or fine and confiscation. Whatever may theoretically be said as to the idea of pecuniary compensation for crime, it must be recognized that there are many offenses against human law, particularly those which are in the nature of *malum prohibitum*, and not *malum in se*, in respect to which physical punishment seems a cruelty, and the only other available recourse is a pecuniary infliction. But this seizure of a criminal's money or property is only by way of punishment, and not because the public has any beneficial claim upon it. It is not an appropriation of private property for public uses or public benefits. It is therefore in no manner inconsistent with that security of property which is among the unalienable rights of man.

I come now to the theme of my remarks, and that is:

THE PROTECTION OF PRIVATE PROPERTY FROM PUBLIC ATTACKS.

The long struggle in monarchical goverments was to protect the rights of individual against the assaults of the throne. As significant and important, though more peaceful in the struggle, is this government of the people to secure the rights of the individual against the assaults of the majority. The wisdom of government is not in protecting power but weakness; not so much in sustaining the ruler, as in securing the rights of the ruled. The true end of government is protection to the individual; the majority can take care of itself.

Private property is sacrificed at the hands of the police power in at least three ways: first, when the property itself is destroyed; second, when by regulation of charges its value is diminished; and third, when its use or some valuable use of it is forbidden. Instances of the first are these: when in the presence of a threatening conflagration a house is blown up to check the progress of the flames: when a house has been occupied by persons afflicted with small-pox or other infectious disease, and so virulent has been the disease, and so many afflicted, that the public health demands the entire destruction of the house and contents by fire to prevent the spread of that disease: when to prevent an overflow in one direction, by which large and valuable property would be destroyed, a break is made in a dyke or embankment, and the water turned elsewhere and upon less valuable property, and crops swept away in order to save buildings and lives. In these and like cases, there is an absolute destruction of the property,—the houses and crops. The individual loses for the public weal. Can there be a doubt that equity and justice demand that the burden of such loss shall not be cast upon the individual, but should be shared by those who have been protected and benefited. It may be, that at common law no action could be maintained against the State or municipality by the individual whose property has been thus destroyed. But the imperfections of the law do not militate against the demands of justice. *Salus populi suprema lex* justifies the destruction. But the equity of compensation is so clear that it has been recognized

by statutes in many States, and provisions made for suit against a municipality to distribute upon the public the burden which it is inequitable that the individual should alone bear. And in enforcing such an equity, no regard is or ought to be paid to the character of, or the use to which the building or property is appropriated. It is enough, that property held by an individual under the protection of the law, is destroyed for the public welfare.

Second, under the guise of regulation, where charges for the use are so reduced as to prevent a reasonable profit on the investment. The history of this question is interesting: certain occupations have long been considered of a quasi public nature,—among these, principally, the business of carrying passengers and freight. Of the propriety of this classification, no question can be made. Without enquiring into the various reasons therefor, a common carrier is described as a quasi public servant. Private capital is invested, and the business is carried on by private persons and through private instrumentalities. Yet, it is a public service which they render, and by virtue thereof, public and governmental control is warranted. The great common carriers of the country, the railroad companies, insisted that, by reason of the fact that they were built by private capital and owned by private corporations, they had the same right to fix the prices for transportation that any individual had to fix the price at which he was willing to sell his labor or his property. They challenged the attempts of the State legislatures to regulate their tariffs. After a long and bitter struggle, the Supreme Court of the United States, in the celebrated "Granger" cases, reported in the 94 U. S., sustained the power of the public, and affirmed legislative control. The question in those cases was not as to the extent, but as to the existence of such control. Those decisions, sustaining public control over the tariffs of railroads and other common carriers as a part of the police power of the State, were accompanied by the case of Munn *vs.* Illinois, 94 U. S., 113, putting warehouses in the same category. The scope of this decision, suggesting a far-reaching supervision over private occupations, brought vigorously up the question as to its extent. If the tariff of common carriers and ware-

house-men was a matter for public control, could the public so reduce the charges that the receipts of the carrier or the warehouse-man would not only furnish no return to the owners, but also not equal the operating expenses;—so that the owner having put his property into an investment, permanent in its nature, and from which he could not at will withdraw, might be compelled to see that investment lost, and his property taken from him by an accumulation of debts from operating expenses?

On this line the struggle was again renewed and carried to the Supreme Court, which in the recent case of Railway Company *vs.* Minnesota, 134 U. S., 418, decided that regulation did not mean destruction; and that under the guise of legislative control over tariffs it was not possible for State or Nation to destroy the investments of private capital in such enterprises; that the individual had rights as well as the public, and rights which the public could not take from him. The opinion written in that case by Mr. Justice Blatchford, sustained as it was by the Court, will ever remain a strong and unconquerable fortress in the long struggle between individual rights and public greed. I rejoice to have been permitted to put one stone into that fortress.

The other class of cases, is where, in the exercise of the police power, some special use is stopped, and the value flowing from that use is thus wholly destroyed. In principle, there is no difference between this and the preceding cases. Property is as certainly destroyed when the use of that which is the subject of property is taken away, as if the thing itself was appropriated, for that which gives value to property, is its capacity for use. If it cannot be used, it is worth nothing; when the use is taken away, the value is gone. If authority were wanting, reference might be had to the decisions of the Supreme Court of the United States, and the language of some of its most eminent judges. In the leading case of Pumpelly *vs.* Green Bay Co., 13 Wall., 166, which was a case where land was overflowed in consequence of the erection of a dam, the Supreme Court thus disposed of this matter.

"It would be a very curious and unsatisfactory result, if, in construing a provision of constitutional law, always understood to have been adopted for protection and security to the rights of the individual as

against the government, and which has received the commendation of jurists, statesmen, and commentators as placing the just principles of the common law on that subject beyond the power of ordinary legislation to change or control them, it shall be held that, if the government refrains from the absolute conversion of real property to the uses of the public, it can destroy its value entirely, can inflict irreparable and permanent injury to any extent, can, in effect, subject it to total destruction without making any compensation, because, in the narrowest sense of the word, it is not taken for the public use. Such a construction would pervert the constitutional provision into a restriction upon the rights of the citizen, as those rights stood at the common law, instead of the government, and make it an authority for invasion of private rights under the pretext of the public good, which had no warrant in the laws or practices of our ancestors."

In the case of Munn *vs.* Illinois, 94 U. S., 141, Mr. Justice Field used this language:

"All that is beneficial in property arises from its use, and the fruits of that use; and whatever deprives a person of them, deprives him of all that is desirable or valuable in the title and possession. If the constitutional guaranty extends no further than to prevent a deprivation of title and possession, and allows a deprivation of use, and the fruits of that use, it does not merit the encomiums it has received."

But surely authority is not needed for a proposition so clear. If one of you own a tract of land usable only for farm purposes, and the fiat of sovereign power forbids its use for such purposes, of what value is the naked title? No profit or advantage comes to you from the possession of that which you cannot use, and no one will buy that which in like manner he cannot use. So whether the thing be taken or its use stopped, the individual loses, he is deprived of his property; and if this is done in the exercise of the police power, because the public health, morals, or welfare demand, his property is sacrificed that the public may gain. When a building is destroyed that a fire may not spread, the individual's property is sacrificed for the general good. When the use of his property is forbidden because the public health or morals require such prohibition, the public gains while he loses. Equal considerations of natural justice demand that he who is thus despoiled for the public good, should not alone bear the burden, but that the public which is benefited should share with him the loss. It is unfortunate that this question came into the courts along the line of

deep feeling, and in the furtherance of a lofty and noble effort to suppress the enormous evils of intemperance. I reluctantly refer to this, for having had some judicial experience in connection with it, I know how angry was the feeling, how biased the judgment, and how bitter were the denunciations. It is unfortunate, I say, that this question came into the courts along the line of such controversy, for it is a familiar saying, "hard cases make bad precedents," and it is seldom easy, under the pressing burden of a great evil, to examine questions in the calm light of simple justice. We look back to the execution of the witches in Massachusetts by judicial decrees as a sad blot on the records of its courts. No one doubts the integrity of the judges by whom those decrees we entered, or does not feel, by way of apology, that the burden of the awful danger supposed to rest upon the community swayed the judicial mind, and bent its judgment.

When the great State of Kansas, in whose past I glory, and in whose future I believe, proclaimed by the voice of its people through constitutional amendment, that the manufacture and sale of intoxicating liquors as a beverage should cease within its borders, humanity rejoiced, and I am glad to have written the opinion of the Supreme Court of that State, affirming its validity and rightfulness. I regret to be compelled to add, that in the glory of success and the furtherance of a good cause, the State forgot to be just. There were four or five breweries, with machinery and appliances valuable only for one use, worth a few thousand dollars, a mere bagatelle in comparison with the wealth of the State, built up under the sanction of the law, owned by citizens whose convictions were different from those of the majority, and who believed the manufacture and sale of beer to be right and wise. As good citizens it was fitting that they should yield to the judgment of the majority. As honest men, it was fitting for the majority not to destroy without compensation; and to share with the few the burden of that change in public sentiment, evidenced by the constitutional amendment. It will be said hereafter to the glory of the State, that she pioneered the way of temperance; to its shame, that at the same time she forgot to be honest and just, and was willing to be temperate at the expense of the individual. Had this ques-

tion come to the courts along other lines, who can doubt that a different result would have followed.

Powder is a confessedly dangerous article. The police power, caring for the public safety, may regulate its storage, its use, its manufacture, and regulating, may prohibit. In the State of Delaware are the Dupont Powder Mills, a large manufacturing property. Had the State of Delaware, by its legislation, prohibited the manufacture and sale of powder as it had a right to do, and thus put an end to this great manufacturing industry and destroyed its value, who can doubt that in proceedings along that line of absolute justice which all men feel, the courts would have hastened to declare that such destruction of property, at the expense of the Duponts alone, could not be tolerated; that the State that enforced such destruction should share with them the burden. Would they not have promptly reaffirmed the thought of Chancellor Kent, —that what the State takes it must pay for; and paraphrasing, added,—that what the public destroys, it must also pay for?

There is not only justice, but wisdom in this rule, that, when a lawful use is by statute made unlawful and forbidden, and its value destroyed, the public shall make compensation to the individual. It restrains from hasty action. It induces a small majority to hesitate in imposing upon an unwilling and large minority its notions of what is demanded by public health, or morals, or welfare. The pocket-book is a potent check on even the reformer. If this rule had been always recognized as in force, would the State of Pennsylvania have enacted that foolish law, forbidding the manufacture and sale of oleomargerine, and thus destroying a legitimate and beneficial industry? or if it had, would the judicial eye have been so blind as not to see through the thin disguise of a pretended regard for public health, to the real purpose of the act,—the protection of another and no more deserving industry, that of the dairy? When a law which is obnoxious to the beliefs of a large minority is forced upon them by a small majority, and that law infringes upon their habits, and destroys their property, all experience demonstrates the difficulty of enforcing such a law. Witnesses commit perjury, jurors forget the obligations of their oaths, public peace is disturbed, animosities are engen-

dered, and every instance of the defeat of the law is welcomed with applause by the sullen and angry minority.

Private property is subject to governmental attack in three ways: First, through taxation: Second, by eminent domain; and, Third, in the exercise of the police power.

So far as the first is concerned, the idea of taxation is the support of the Government by those who are protected by it, and no one can complain of a tax which responds to that obligation. While there is no return of money or property to the tax-payer, there is no arbitrary taking of property without compensation. It is always understood that the government, the public, returns a full consideration. In fact, taxation, whether general or special, implies an equivalent: if special, increased value to the property by the contiguous improvement; if general, protection to person and property, security of all rights, with the means and machinery for enforcing them and redressing all wrongs. Taxation on any other basis cannot be justified or upheld. Whenever it becomes purely arbitrary, and without an implication of an equivalent in one way or another, so that the public takes the property of the individual giving nothing in return, or when the burden is cast wholly upon one or two, and all others similarly situated are relieved, the act passes beyond the domain of just legislation, and rests with the rescripts of irresponsible and despotic power. It is not to be expected that any law of taxation can anticipate or adjust itself with mathematical accuracy to all the various conditions of property. It must always be adjudged sufficient, if the general scope of these statutes is uniformity and justice. Errors which may and do arise in the enforcement of the general rules of such a statute, are not available to deny its validity or impugn its justice. We stand to-day at the threshold of two thoughts and two demands; one is, that land is the common property of all,—as air and light: that ownership of land is as much against common right and justice, as an appropriation of the free light and air of heaven: that, in view of existing social and economic relations, and to sugar-coat the pill by which title in land shall be destroyed, the burden of taxation should be wholly cast upon land, a burden growing until not only the needs of government be satisfied, but the support and educa-

tion of all the poor be provided for; and in that way the owners of such property be despoiled thereof not directly, but indirectly and through taxation. The other door, which is as yet but slightly ajar, opens to the proposition which, ignoring all differences of property, says that he who toils and accumulates, and is protected by the State in that toil and accumulation, has all the obligations of protection discharged at his death; and that then all his accumulations should pass to the State,—leaving only to his heirs the same freedom of toil and accumulation, and the like protection which he has enjoyed. I do not care to enter into any discussion of the merits of these measures; but pass with the single observation, that in a democratic government, which means the equality of the individual from his cradle to his grave in all matters of common right, the latter proposition is more just, and more in accord with the principles of human equality. Indeed, I think it is worthy of most serious consideration, whether a partial enforcement of this rule is not demanded in a government of the people;—a government based on person and not on property, whose theory is not of class by accident of birth, but of original equality in the individual, and no other aristocracy than that of personal toil and accumulation.

With regard to the second attack, that through the exercise of the power of eminent domain, the established law is, that where the exigencies of the government demand the appropriation of private property to public use, full compensation in money must be paid. This is generally enforced by constitutional provisions; but even if there be no such provision, I endorse the thoughtful words of the great commentator of American law, when he says: "A provision for compensation is a necessary attendant on the due and constitutional exercise of the power of the lawgiver to deprive an individual of his property without his consent; and this principle in American constitutional jurisprudence is founded in natural equity, and is laid down by jurists as an acknowledged principle of universal law."

But the matter to which I wish to call your special attention, and which is the main subject of my talk, is the spoliation and destruction of private property through the agency of that

undefined and perhaps indefinable power, the police power of the State. I say undefined and perhaps indefinable, for no man has yet succeeded in giving a definition which, in anticipating future contingencies, has prescribed exact limits to its extent. It is that power by which the State provides for the public health, and the public morals, and promotes the general welfare. It is the refuge of timid judges to escape the obligations of denouncing a wrong, in a case in which some supposed general and public good is the object of legislation. The absence of prescribed limits to this power, gives ample field for refuge to any one who dares not assert his convictions of right and wrong. For who, against legislative will, cares to declare what does or does not contribute to public health or public morals, or tend to promote the general welfare? *Omne ignotum pro magnifico.* I am here to say to you, in no spirit of obnoxious or unpleasant criticism upon the decision of any tribunal or judge, that the demands of absolute and eternal justice forbid that any private property, legally acquired and legally held, should be spoliated or destroyed in the interests of public health, morals, or welfare, without compensation.

But it is said, and said by high authority, that when, by legislative act, a particular use of property is forbidden, its subsequent use is unlawful, and a party thereafter attempting such use, may rightfully be deprived of the value of property as a punishment for his crime. This ringing changes on the words immoral, unlawful, crime, and punishment is the mere beating of Chinese gongs to conceal the real question. No one doubts, that if, after the legislature had prohibited a particular use of property, any individual devotes his property to that use, he is guilty of a criminal act and invites and deserves punishment, even to the destruction of the value of that use which he has attempted to create in defiance of the law. But it is a very different proposition,—that, when a party has created the use in obedience to and with the sanction of the law, a legislature has a right to prohibit such use in the future, and by making it unlawful, destroy without compensation the value which was created under the sanction of the law. In criminal matters, *ex post facto* legislation is always denounced. If one does an act which to-day is within the sanction of the law, no

legislature can, to-morrow, by a statute prohibiting such acts, reach backward and make that unlawful which was lawful when done, or punish him as a criminal for that which when done he had a right to do. Neither can it, in civil matters, disturb vested rights. If there be no law against usury, and a person loans money upon a contract to pay ten per cent. interest, no subsequent legislation making five per cent. the extreme lawful rate, and forfeiting all principal and interest in case more is taken can destroy that contract, or release the borrower from his obligation to pay the lender principal and ten per cent. interest. No more can the value of a use created under sanction of the law be taken away from its owner, by a mere arbituary declaration of the legislature that such use must stop. Legislation looks to the future and directs its conduct. It does not look backward, or turn a lawful act into a criminal one; nor may it, under the guise of the police power, rob an individual of any lawfully acquired property or value.

So, out from these considerations I work this thought: That while the government must be the judge of its own needs, and in the exercise of that judgment may take from every individual his service and his property, and, in the interests of public health, morals, and welfare, may regulate or destroy the individual's use of his property, or the property itself, yet there remains to the individual a sacred and indestructible right of compensation. If, for the public interests and at the public demands, he sacrifices his time, his labor or his property, or any value therein, he has a right to demand and must receive at the hands of the public compensation therefor. The full, absolute, and unqualified recognition and enforcement of this right are essential to the permanence of all governments, especially of those by, of, and for the people. In the picture drawn by the prophet of millenial days, it is affirmed that "They shall sit every man under *his* vine and under *his* fig tree, and none shall make them afraid; for the mouth of the Lord of hosts hath spoken it." If we would continue this government into millenial times, it must be built upon this foundation. To accomplish this, we must re-cast some of our judicial decisions; and if that be not possible, we must re-write into our Constitution the affirmations of the Declaration of Independence, in language so clear and peremp-

tory that no judge can doubt or hesitate, and no man, not even a legislator, misunderstand. I emphasize the words clear and peremptory, for many of those who wrought into the Constitution the Fourteenth Amendment believed that they were placing therein a national guarantee against future State invasion of private rights, but judicial decisions have shorn it of strength, and left it nothing but a figure of speech.

Young gentlemen, you stand at the open door of a great profession,—at the morning hour of an era of great social changes. The motto of that profession is "justice." Justice not alone to the public, but equally to the individual. Not alone to the strong and wealthy, but also to the feeble and poor. Not alone to the popular, but to the unpopular side. The men whose names shine illustrious on the rolls of that profession,—Hale, Mansfield, Erskine, Marshall, Chase, and Lincoln, voice their great appeal to you not alone by the magnificence of their ability and the wealth of their learning, but as much by their devotion in times of trial, and in the midst of threatening and popular feeling, to the demands of absolute and unfailing justice. From the halls of Westminster, Lord Mansfield looked out on the swelling mass of an angry mob, and, gazing beyond the present to the heights of the future, boldly declared,—"I wish popularity; but it is that popularity which follows, not that which is run after. It is that popularity, which sooner or later never fails to do justice to the pursuit of noble ends by noble means." In this coming era, great social changes will take place. A more equal distribution of the wealth of the world, and the elimination of the pauper from our midst will be secured. Many and various will be the means suggested for accomplishing these desired and glorious changes. To the lawyer will come the sifting and final judgment on the righteousness and justice of these various schemes. Into that profession, and into this era, I welcome you,—and welcoming, I bid you remember that not he who bends the docile ear to every temporary shout of the people; but he only who measures every step,—even in defiance of angry passions, by the unchanging scale of immutable justice, will win the crown of immortality, and wear the unfailing laurels. In all your lives, and in all your acts, bear with you the motto of our profession: *Fiat Justitia.*

Article II.—IDEALS OF MEDICAL EDUCATION.

Address delivered before the Medical Faculty of Yale University, June 23, 1891, by John S. Billings, M.D., Surgeon U. S. Army, Washington, D. C.

When the medical faculty of an ancient, famous, and progressive university honors a physician by the request that he will deliver an address to it, and to its friends, upon such an occasion as this, the subject of that address must be sought within certain limits. It should have some relation to the special work of the Faculty—to medical education as it was, or is, or should be. The fact that you have already had three addresses bearing on this subject by distinguished medical teachers, who are more familiar with its practical bearings and needs than I can be, does not authorize me to try another field, although it greatly increases my difficulty in selecting reflections and suggestions which are suited to the occasion and to the audience, and which, at the same time, will not be a wearisome repetition of what is already familiar to you. I know, however, that discourses of this kind are soon forgotten; were it otherwise, this would indeed be a hard world for address givers.

Of course the Medical Department of Yale is organized in the best possible manner, and is doing the best possible work, —under the circumstances. I do not know precisely what its organization is, or what work it is doing, or the exact circumstances which govern it, but I have no doubt it is safe to assume this. There is one circumstance, however, which very commonly affects medical schools and universities—and which, therefore, may possibly affect you—and that is the want of means to do everything that anybody may consider desirable. Perhaps, then, some remarks upon certain modern ideals of medical education, and upon first class medical schools and their cost, based upon data derived from other schools, may be of some interest,—especially in the light of Rochefoucald's

aphorism that there is something in the misfortunes of our best friends which is not displeasing to us.

The great mass of the public—the majority of the voters of all parties, and of the women who are not voters, know little and care less about the details of professional education, or about the standard of qualification attained to by those to whom they entrust more or less of the care of their souls, their property, or their bodies. The popular feeling is, that in a free country every one should have the right to follow any occupation he likes, and employ for any purpose any one whom he selects, and that each party must take the consequences.

It is noteworthy, however, that each individual professing to hold this opinion, almost always makes an exception as to his own occupation if it is one involving skilled labor,—he is in favor of free trade in the abstract—and of limitations with regards to his own particular trade, either as to number of apprentices, as to time of study, or as to some form of trust which will, as far as possible, prevent competition in that special business. In one of its aspects, medicine is a trade, carried on for the purpose of making money in order to support the physician and his family, and to the majority of practitioners this is a very important aspect, although to very few of them is it the only one. Hence it is that medical faculties must consider schemes of medical education from this point of view also, not exclusively so by any means, but, nevertheless, with reference to the questions—what do we propose to offer?—how much will it cost us?—how much shall we charge for it? With reference to the first question, it is obvious that there are several quite different kinds of education which a medical faculty may offer to its students. It is by no means easy to decide as to the quality and quantity of the article offered by consulting only the advertisements, circulars, and prospectuses of the hundred and more medical schools in the United States, but even from these it can be seen that one can get a diploma of Doctor of Medicine in much less time, and at much less expense, from some schools than from others, and we all know that the diplomas of these different schools are guarantees of very different education and qualifications.

There are also several different ideals as to what is desirable in medical education. For instance, there is the ideal of the literary man, of the clergyman—of the laborer, and of other classes of the general public. There is the ideal of the man who wants to obtain a medical degree as soon and as cheaply as possible in order that he may commence practice; the ideal of the same man after he has obtained such a degree and has been for two or three years trying to get practice; and the ideal of the middle aged successful practitioner who has learned several things by experience since he graduated. Then we have the ideal of the Army and Navy examining boards; the ideal of the man of means who wants to become a specialist without ever going into general practice—and the ideal of the man who wishes to be an investigator and a teacher either from the love of science or from the desire for fame. Let us consider some of these ideals briefly. The chief demand of the great mass of the non-professional public is for general practitioners,—and the qualifications which these should possess may be summed up in the statement that they should be competent to recognize the forms of disease and injury which are common in the community in which they practice,—and should know, and be able to apply, the remedies which are most frequently used and found efficacious in such cases. They are expected, for the most part, to follow and not to lead—it is not necessary that they should be skilled in the refinements of modern pathology—or be thoroughly trained in minute anatomy or experimental physiology, or be great surgeons, or be well up in all the specialties. Observe that I say it is not *necessary*—it may be desirable, but in the majority of cases it is not practicable.

In their brief journey of life through this world, the great majority of people must travel on the routes and by the vehicles provided for them by others, and, fortunately, they are usually content to do so. They move in groups which are "personally conducted," see the things they are told to see, try, with more or less success, to admire the things which they are told to admire, and their chief discomfort occurs when their conductors are either silent, or give contradictory orders, when it comes to the parting of the ways. Most travelers on

an Atlantic steamer accept without murmuring the edict that "Passengers are not allowed on the bridge."

The information which those who propose to earn their living by the general practice of medicine stand most in need of, is that which will enable them to recognize the ordinary emergencies of practice and to deal with them in the ordinary way. As students, their time, money, and zeal for study and investigation, are all usually more or less limited, and there are many things in a course in what is called the "higher medical education" which are of comparatively little use to them. The clinical instruction which they can get at a school in the region of country in which they intend to practice will often be more valuable to them than that which they could get at a distant school of greater repute, simply from the difference in the class of cases presenting themselves for treatment. "Good local pilots are in demand, although we have a Superintendent of the Coast Survey." In some respects, the old fashioned system of medical apprenticeships, in which the student spent from one to three years in the office of a physician in general practice before he went to a medical school to hear lectures, was a good one for producing these general practitioners. To learn to do such work easily and properly one must live among the sick, learn how they look, how they talk, how they are to be talked to and handled; and must do this at close quarters, and not by looking on from the top bench of an amphitheatre, or from the outer ring of a group of thirty or forty men standing around a bed. Moreover, it is the common everyday ailments and their effects and treatment that the student wants to become familiar with at first, rather than the rare cases. Cases of colic, of effects of over eating or drinking, of sore throats, croup or diphtheria, or scarlet fever or mumps, or the ordinary fevers, of simple fractures and dislocations, of bad cuts of the palm of the hand—are far more important to him from a business point of view than brain tumors or ligations of the innominate artery.

And these comparatively simple, every-day cases are just what the young man reading in the office of his preceptor may become familiar with. How many of the men without such experience, who graduate this year at our great medical

schools, have ever seen closely a case of measles, or scarlet fever, or incipient small-pox—or have actually looked into the throat of a child suffering from diphtheria, or have ever assisted in adjusting and dressing a fractured thigh bone, or in getting the clothing off from a case of extensive burn or scald? I have no doubt most of them could repeat the descriptions of these things which they have heard or read, but they are not as well prepared to deal with such cases in that unhesitating way which commands confidence, as is the man who has seen and touched one or two such cases in his preceptor's office, and has observed what that preceptor said and did. On the other hand, the number of practising physicians who are qualified to act as preceptors, and who are willing to give the requisite time and attention to students, is very limited,—and with any other kind of preceptor, the student wastes much time, is apt to lose interest, and becomes idle and unfit for continuous mental effort.

If the student spent his apprentice year, or two years, in a preceptor's office either at the end of his first or second year's medical lectures, or after obtaining his degree, it would be much better for him,—but the latter course is open to the objection that he would probably think that he knew more than his preceptor. The Scotch medical schools prefer that the year spent as an articled pupil shall come after the first two years of education in a medical school. The decision of the British Medical Council has been that a five years' course of study shall be compulsory, and that the last year shall be spent in practical work.

Theoretically there is still a considerable amount of preliminary reading with a preceptor done in this country, but practically, this method of beginning the study of medicine is fast disappearing. Through the kindness of the officers of some of our large medical schools, I have obtained some data on this point from which I infer that in the eastern schools the proportion of students who claim to have read with a preceptor for one year before commencing lectures, is from 1.5 to 30 per cent., and in western and southern schools, from 25 to 60 per cent., but no doubt such reading, in the majority of cases, was merely nominal, and the student had seen little or nothing

of practice. In most schools the certificate of the preceptor is not required.

The ideal of the average student who is in a hurry to begin practice needs no special description. What he wants is to pass the examinations with the least possible labor,—the less he is compelled to take for his money the better he is pleased. The ideal of the majority of the medical profession as to what should be the minimum course of study for the degree of M. D. appears to be that the student should first obtain at least such a preliminary education as is furnished by our ordinary high schools, and then should study medicine four years, the first of which may be with a preceptor, and three of which are to be occupied in attending a graded course of lectures, the last two years being largely devoted to clinical and hospital instruction. About one-third of our medical schools have expressed their intention of carrying out this programme. As regards the time, it is not sufficient, according to European standards, but is perhaps the best general standard which can be fixed at present for the education of the general practitioner for this country. Its success depends upon whether the student has had the needed preliminary education. It is the want of this last which is the chief deficiency.

The ideal of the Army and Navy Examining Boards is that a Surgeon in the Government service should have received either the literary, classical, and mathematical training of the ordinary college course for the degree of Bachelor of Arts, or the training leading to a degree in scientific studies—and that after that he should have spent five years in medical studies, the last year as resident in a hospital.

This ideal cannot yet be enforced in either service, for the reason that they could not get enough men who come up to this standard to fill the vacancies, so that the actual standard is somewhat lower than this, although it is higher than the minimum standard of any medical school or of any State Board of Examiners. Through the courtesy of the Surgeon Generals of the Army and Navy, I am able to give you the following results of the work of their Examining Boards for the last ten years.

Before the Army Boards 348 candidates presented themselves during this period, of whom 76, or 22.3 per cent. were approved and passed; 31 were rejected for physical disqualifications; 90 failed to pass the preliminary examination; and the remainder failed to pass the medical examination. The rejections for physical defects are for the last three years only.

Before the Navy Boards 237 candidates presented themselves, of whom 55, or 23.1 per cent. were approved and passed; 75 were rejected for physical disqualifications; and the remainder either withdrew or failed to pass.

Evidently the standards of the two Boards are about the same. The proportion of those rejected for physical defects is noteworthy. In a general way we may say that about one-fourth of the candidates before such boards are approved—and one-fourth fail on the preliminary examination as to general education. Putting aside those rejected for physical causes, and making the necessary corrections for a certain number who came before the Boards more than once, we find that of 429 examined, 129 or 30.2 per cent. were successful.

Of those candidates who had a college degree, 34 per cent. succeeded, and of those who had no such degree, 28.9 per cent. succeeded. Of those candidates who had had one year's residence in hospital, 40 per cent. passed, while of those who had not been residents, only 21 per cent. were successful. The percentage of successful candidates from different schools varies greatly, ranging from 9 to 56 per cent. for those schools from which more than ten candidates presented themselves. I cannot go into details on this point, but may say that taking the Medical Schools of Harvard, Yale, the College of Physicians, and Bellevue Hospital of New York, the University of Pennsylvania, and the University of Virginia together, of 141 candidates, 65 or 46.1 per cent. succeeded, while for all the rest of the schools in a body, of 286 candidates, 64 or 22.3 per cent. succeeded.

The figures from Yale alone, are too small to draw accurate conclusions from, but in strict confidence I will tell you that of the five graduates of the Yale Medical School who came before the Army and Navy Boards during the last ten years, three, or 66.6 per cent. have passed. The greatest percentage of success-

ful candidates comes from those who were between 24 and 25 years of age when they graduated, being 31.7 per cent. as against 27.9 per cent. for those who were under 22, and 26.2 per cent. for those who were over 25 on graduation.

Admitting it to be a fact that different schools have different minimum standards for graduating Doctors of Medicine, to what extent are these differences necessary, or desirable? There is at present a very general demand that those schools which have the lower standards shall raise them to the ideal of the medical profession just stated. It seems as if the supply of physicians is now, in most parts of the country, in excess of the demand, the number of medical men being from two to three times as great among us, in proportion to the population, as it is in France or Germany, while the annual number of graduates also greatly exceeds the number of places to be filled.

Under these circumstances, there is necessarily a struggle for existence in which the men of inferior qualifications usually, though not always, fail. The schools, however, will not shape their course so much with reference to the real or supposed interests of the profession or of the public, as with reference to the demands of their immediate customers, the students, and many of these, as has been said, do not want any more education than is absolutely necessary to enable them to begin practice. The ability and inclination to pay for professional services differs greatly in different localities, and among different classes of people. Attempts to enforce a minimum time for the course, and a minimum for the number of lectures in certain specified branches, will not result in fixing an uniform minimum of results obtained, for this can only be assured and maintained by some system of inspection and testing of results which is independent of the schools, or, at all events, of each individual school. When, as Professor Sumner says: "A and B put their heads together to see what C ought to be made to do for D," there is small prospect of result so long as C is free to do as he likes.

In the Russian myth, when the raven brought the water of life and the water of death to the gray wolf, the first thing that the wolf did was to test their powers on the raven himself to

determine whether his task was properly done. The public do not have an opportunity of seeing the effect of such a test as this upon those who come to them from the schools professing to have obtained the knowledge of healing; if they had, the complaints of overcrowding in the profession would probably cease.

From a commercial point of view it seems plain that there are too many medical schools in this country, that the education which many of them are giving is a very poor one, and that the students who are attracted to these last by offers of a cheap and short course, waste their time and their money.

The only really efficient remedy for this state of affairs is a system of State examinations with minimum standards. This also has its evils, since it must lead to cramming, but it is the best we can do at present. It is urged by some that this minimum standard should be uniform throughout the United States —but in that case, it would be unnecessarily low in some parts of the country. The precise nature of the requirements in different regions depend on the density of population, and on the ability of the great mass of the people to pay enough to induce highly educated physicians to settle among them. It would be better if it were otherwise, and if everyone could have the benefit of the best professional skill, but matters are adjusted in this world largely by conflict of interests. Certainly no one who intends to practice medicine should be content with the least amount of knowledge which will enable him to pass the required examinations, whatever the standard of those examinations may be. Putting aside now this matter of a minimum standard, let us consider briefly an ideal of a medical education of a higher type.

In addition to the incipient family practitioner of ordinary qualifications—the beginners in the profession—there is need of, and employment for, highly skilled, thoroughly trained physicians and surgeons as family physicians, as consultants, as specialists, and as investigators and teachers.

There are two ways in which these needed men may be educated and developed. The first is by their commencing with the ordinary course of instruction for general practice in the manner just spoken of, and then going on, after graduation and

commencing practice, to study and perfect themselves in details —according to individual tastes and opportunities; and this has been the course pursued by a large number of our most distinguished American consultants and specialists. The other is to lay a broad and sound foundation of preliminary education before giving any attention to clinical study or practice. This means an education at least equivalent to that required of candidates for the degree of Bachelor of Arts from our leading universities, including Latin, French, and German, and mathematics to include trigonometry, and the elements of analytics. It should also include one year's work in a physical laboratory, two years' work in chemistry, two years' work in biology,—at least one year's work in practical anatomy—and one year's course in materia medica.

In other words, it requires that the youth of sixteen, having obtained a good high school education, shall go on to spend at least five years in additional study before he commences to see anything of practice. He should then spend at least three years more in special medical and clinical studies, during one year of which he should, if possible, reside in a hospital. If then his purpose is to become a specialist, an original investigator and a teacher, it is desirable that he should spend two years more in clinics and laboratories devoted to his special subject—and at least half of this time should, at present, be spent abroad. These are the broad outlines of what I suppose most physicians of the present day would consider a desirable scheme of medical education for an intelligent boy with a fair amount of liking for study, good health, and sufficient means to enable him to go through with it without making undue demands upon his parents or guardians.

You will observe that there are several qualifying clauses in that last sentence. The aphorism that it does not pay to give a five thousand dollar education to a five dollar boy, must be constantly borne in mind in considering these questions. On the other hand, it is also to be noted that in the preparation of educational schemes, it is not necessary to provide for the demands of youths of extraordinary ability and industry—for men of genius. Beds suitable for giants are not required as part of the stock of an ordinary furniture store, especially if

it require giants to make them. Some cases of disease will recover without treatment, though the cure may be hastened by proper management, some will die under any treatment, the result of some depends on the treatment. It is much the same in education. Some will acquire knowledge and power without special training,—others will never acquire those things under any training, but the career of many depends, to a large extent, on the training which they receive. The recent announcement of a compulsory four years course of medical studies by Harvard and the University of Pennsylvania, soon to be followed by a similar announcement from Columbia, looks towards this ideal.

The number of those who are obtaining a college education as a preparation for medical study has increased, and will still more inerease as the competition among an excessive number of physicians becomes fiercer.

From information received from some of our leading medical schools for the present year, it appears that the proportion of students who have taken preliminary degrees before commencing the study of medicine varies from 14 to 43 per cent. in eastern schools, from 3 to 12 per cent. in western schools, and from 15 to 20 per cent. in southern schools.

Just here comes in a very difficult point. When shall general education cease and special training begin? The answer to this must depend largely on the individual, but it seems to me that the present tendency is to begin to specialize too soon. This early specialization of study and work may lead to more prompt pecuniary success, but not, I think, to so much ultimate happiness and usefulness as the longer continuance of study on broader lines. "For it is in knowledge as it is in plants: if you mean to use the plant it is no matter for the roots; but if you mean to remove it to grow, then it is more assured to rest upon root than slips; so the delivery of knowledge as it is now used, is of fair bodies of trees without the roots—good for the carpenter but not for the planter. But if you will have science grow, it is less matter for the shaft of body of the tree, so you look well to the taking up of the roots."*

* Lord Bacon.

In discussions on medical education and the duties of medical schools, we are too apt to lose sight of the fact that the best that the student can do in them is to begin to learn. If he does not study much longer and harder after he graduates than he does before, he will not become a successful physician. Moreover, the great majority of men have different capacities for learning certain things at different ages. They lose receptive power as they grow older.

Permit me to use here a personal illustration, and pardon the apparent egotism of an old gentleman who refers to his youthful days. Thirty-three years ago I began the study of medicine, having obtained the degree of Bachelor of Arts after the usual classical course of those days. It so happens that the smattering of Latin and Greek which I obtained has been of great use to me, and I may, therefore, be a prejudiced witness, but my acquaintance with many physicians at home and abroad has led me to believe that the ordinary college course in languages, mathematics, and literature is a very good foundation for the study of medicine, and I do not sympathize with those who demand that all who are to enter on this study shall substitute scientific studies for all the Greek and a part of the Latin of the usual course. This change is good for some but not for all. I had attended lectures in physics and chemistry but had done no laboratory work, and I could read easy French and German. Thus equipped I began to read anatomy, physiology, and the principles of medicine. Nominally I had a preceptor—but I do not think I saw him six times during the year which followed, for I was teaching school in another State. Nevertheless, he told me what books to read, and I read them. The next thing was to attend the prescribed two courses of lectures in a medical college in Cincinnati. Each course lasted about five months and was precisely the same. There was no laboratory course, and I began to attend clinical lectures the first day of the first course. One result of this was that I had to learn chemical manipulation, the practical use of the microscope, etc., at a later period when it was much more difficult. In fact I may say that I have been studying ever since to repair the deficiencies in my medical training and have never been able to catch up.

Probably a large number of physicians over fifty years of age have had much the same experience, and felt that there are certain things, such as the relation of trimethyloxyethylene-ammonium hydroxide in the body, or the causation of muscular contraction by migration of labile material between the inotag-mata—the bearings and beauty of which might as well be left to younger men. Not that these things are specially difficult to understand, but they form a part of a new nomenclature which in most cases it is not worth the while of the older men to learn, because it is far more difficult for them to master it than it is for their sons. One of the most comfortable and satisfactory periods in a man's life is that when he first distinctly and clearly recognizes that in certain matters he is a hopelessly old fogy, and that he is not expected to know anything about them.

Having thus roughly sketched what is wanted in the way of medical education by different classes of students—the article for which there is market, let us next consider briefly what an university may wisely attempt to provide in this direction. Some suggestions on this point may perhaps be obtained from an examination of the condition of affairs as regards medical education in the University of Oxford.

The Corporation of Oxford has a little more than half the number of inhabitants possessed by the City of New Haven, and its relations to London are, in many respects, similar to those of New Haven with the cities of New York and Boston. For a number of years it has been urged by some physicians in England, that the University of Oxford, with her great resources, has not been doing as much for medical education as she should have done, and that it is her duty to establish and maintain a completely organized medical school of the usual pattern, using the small local hospital and dispensary facilities for the clinical side of the work.

On the other hand, other physicians, of whom my friend Sir Henry Acland may be taken as the representative, maintain that it is much better that Oxford should use her resources in giving a broad foundation of literary and scientific culture, including, for those who propose to study medicine, the means of special instruction in general biology—and comparative and

human anatomy, physiology, and pathology—and that the men thus prepared should go to the great Hospital Medical Schools of London to obtain their clinical training, after which, they may return and pass their final examinations and obtain the coveted degree of Doctor of Medicine from the university.

There is no doubt that this can be done, and that a great part of the scientific foundation of a complete medical training can be furnished by a well equipped university, with little or no reference to clinical instruction at the same time and place. This, for example, is the course followed by many of the students in the medical department of the University of Virginia, and it seems to me that there is also no doubt that the men who go through such a course of training, followed by clinical training in a great city, will have a better course of instruction, a wider experience, and a better chance of seeing and appreciating the methods of great clinical teachers, than would the majority of those who obtained their clinical as well as their scientific training in the small town, or than those who obtain all their instruction in a large school devoted exclusively to medical studies. Upon this last point I need not dwell, for Dr. Welch, in his address before you in 1888, has clearly pointed out the advantages of giving to a medical school an university atmosphere, and of making the union of the school and the university close and intimate. It should be noted, however, that the more true this is, the more it is the duty of an university to maintain such a school, because educational work which cannot be, or is not, done so well elsewhere, has superior claims upon university aid. The chief thing which can be said in favor of the attempt to attract a large number of medical students of average qualifications to an institution having the means to give the higher education are, first, that it brings in more money—and, second, that it enables those professors who desire advanced workers, to select these from a somewhat wider field. Also it should be remembered that the small hospitals of from 50 to 100 beds should be fully utilized for clinical teaching, even if they cannot furnish all the clinical material that is desirable for a complete course of instruction.

It must be confessed that nearly all our great American universities are unwilling to apply their funds to the creation and

are willing to have such a department no doubt, but they want the money for establishing and maintaining it to be provided in addition to the money which has been, or is to be, provided for the general purposes of the university. The ideal university culture of the present day appears to be designed to fit a man to take pleasure in his own thoughts and musings, and in mental exercise in languages, literature, the higher mathematics, and the problems of physics and natural history. Incidentally his knowledge of these things may not only give him pleasure, but enable him to help others, but the studies are not to be pursued on account of any practical utility which they possess, but for the love of learning and pure science, i. e. for personal gratification of a particular kind. Those who hold these views are apt to consider medicine as a technological matter, which should be left altogether to special schools, because, being practically useful in a commercial sense, the means of teaching it are sure to be provided through commercial interests, just as they are sure to be provided for the teaching of practical engineering. This is far from the old university idea as embodied in the three faculties and four nations of the University of Paris. So far as the interests of the public are concerned, it is only the possession and control of a large amount and variety of clinical material, or of unusually qualified clinical teachers, which makes it the positive duty to use it, or them, for purposes of medical instruction in order to train ordinary general practitioners of medicine. There is no present deficiency in the number of such practitioners, and we certainly have plenty of schools for producing them, so that there is no fear of failure in the supply.

But in medicine as in every other profession, art, or trade, the supply of the best is never too great, and the demand for something better than that which already exists never ceases.

What then does an university, or its medical school, need in order that it may be able to supply the demand for this higher medical education? First,—competent teachers. Second,—suitable buildings, collections, books, and apparatus. Third,—clinical material. To secure and retain these things requires money, and brains to use it. First as to the competent teachers. There are many teachers available—but the number of these who have shown that they are competent for and suited to

positions in a medical school which is to supply the best and something better, is limited—much more so than one who had not tried to find them would suppose, and these few are not seeking engagements. How many anatomists, or physiologists, or pathologists, of the first class, thoroughly trained, authorities in their special fields, capable of increasing knowledge, and with the peculiar gift of ability to teach—do you suppose there are in this country? It is a liberal estimate to say that a dozen of each have thus far given evidence that they exist. And the great clinical teachers in medicine and surgery,—the men who are up to the times in matters of diagnosis, pathology, and therapeutics, and who are also successful teachers both by the spoken and written word—how many such have we—and especially how many such have we who are not fixed and established, so that they may be induced to go to a school which needs them? Such men are either men of genius, and even this boasted nineteeth century has produced them rarely, or they are men of talent made the most of by unflagging industry with special opportunities, and they are also rare. Yet these are the men whom a great university should seek to obtain, and retain, for her faculties. To do this, and to get the best work from such men, is by no means a mere matter of salary, although sufficient salaries must be paid. We have also to consider the buildings, collections, books, and apparatus required, and this is largely a question of money. How much money? What would be the cost of establishing and maintaining a first-class medical school in this country at the present time? Let us suppose that 150 students are to be provided for —that the course of instruction for those coming with a good high school education is to occupy four years, and for those coming with the degree of Bachelor of Arts, and having done at least one year's work in a chemical laboratory and one year's work in a biological laboratory, the course shall occupy three years, that the last year's studies shall be almost exclusively clinical, and that provision is to be made for advanced post graduate work.

We shall want then, practical anatomy rooms for 50 students, a physiological laboratory, a pathological laboratory, a pharmacological laboratory, a laboratory of hygiene, and the means of

clinical teaching, a library and a museum. The days have long gone by when one or two amphitheatres or lecture rooms and a small museum, were all the outfit required for medical teaching. The little amphitheatre of the University of Bologna was sufficient for almost every purpose of medical teaching as that was carried on three hundred years ago, but now the lecture room is the smallest part of the outfit required. In his evidence before the Royal Commission, Professor Lankester stated that to establish such a Medical School at Oxford as he thought desirable, about $225,000 would be required for buildings in addition to those already existing, and that about $100,000 a year would be required for running expenses. Professor Billroth estimates that about $400,000 would be required for buildings for the medical department of a university, exclusive of the building for clinical teaching, which he thinks would cost about as much more,—and that the annual expense would be about $105,000. He says that these estimates are based on an average standard of efficiency—not the highest—and concludes by saying, "let us hope that a rich man may some day give three millions of dollars to found a school to be devoted to medicine and natural science."

Perhaps these figures may seem high to you. Yet building is cheaper, and salaries lower in England and in Germany than with us—if only first-class work and first-class men are accepted. To build and equip a laboratory which shall give work room for 75 men, will cost here between $75,000 and $100,000. At least four such laboratories are needed by the ideal medical department, besides a building for general lectures, library, etc., which would cost about $50,000.

It is of course possible to consolidate all these into a single three or four story building and thus save money, especially in cost of ground—but the results are not so good. I am not speaking now of temporary makeshift buildings, but of permanent structures—which, though plain, should not be hideous, and should be thoroughly well built. Where land is abundant and not too dear, it is usually better to construct these laboratories one at a time and endeavor to secure for each, a proper endowment and equipment. The average expenses of each laboratory may be put at $15,000 per annum. In other words,

in requires about $400,000 to build, equip, and endow a physiological, pathological, or hygienic laboratory such as is suited to the needs of a first-class university in this country. By paring down in various directions, this sum can be reduced to $300,000, but not lower without seriously impairing the efficiency of the plan. And in all this I have said nothing of the cost of the means for clinical instruction—which should be borne, in part, at least, by the school, for the simple reason that only by doing this can the school have that control of hospital appointments which is so necessary for its proper work.

Of course every professor who is skilled and energetic, and who is imbued with the true university spirit, has innumerable wants and suggestions which require money to supply and carry out. He wants the new books and journals relating to his specialty, specimens, apparatus, models and illustrations, and if he is at the head of one of the laboratories which I have named, the sum of $15,000 per annum will be required to pay him and his assistants, and to provide for their needs. All this means that the educating of physicians on this plan will cost the medical department between four and five thousand dollars for each graduate. It will receive from them $800 to $1,000 each, and the balance must be made up from subscriptions, appropriations, or endowments. Practically endowment is the only resource.

The student himself has to give four or five years time and labor and four or five thousand dollars to obtain his medical education. For some, this expenditure of time and money will be an excellent investment—for others not, even if they have enough of both to spare for this purpose. After all, the most that the university can do is to afford opportunities for learning, and a certain kind and amount of stimulus to mental work. The professor may declare that he will teach certain branches, but there are some sent to him for instruction who are not teachable, and the only thing he can do is to return them as little damaged as possible.

The number of men for whom it is specially desirable to provide laboratory and other special facilities for original work in physiology, pathology, pharmacology, and hygiene, is limited. There are not a great number of men who have the maintenance of a well equipped medical department. They

desire and the qualifications necessary for this sort of work, and the number of positions in which they can find remunerative employment in devoting themselves to such investigations, is still more limited.

The laboratory facilities in Germany are, as a whole, at present in excess of the number of properly qualified men who can be found to make use of them, although a few are overcrowded.

Advanced work and original investigations cannot, as a rule, be made by undergraduates, if for no other reason than that of lack of time.

Is it advisable that the same medical school shall undertake to furnish such different courses as to provide for all wants—to offer to meet the minimum requirements for the Degree of Doctor of Medicine, as well as the wants of those who demand more advanced and detailed instruction? The answer to this depends largely on the location of the school, and on the means which it can command, especially as regards facilities for hospital and clinical instruction. In any case, its diploma of Doctor of Medicine should have an uniform value, and if it does undertake the double function, the higher education must be largely post-graduate work. It must also be, to a great extent, a voluntary matter on the part of both schools and students.

As indicated at the beginning, this address is not intended to criticize existing medical institutions, or to give specific advice to any college or university. I have simply tried to formulate roughly what seems to be the present ideal of a course of medical education in the minds of many physicians, and then to show what the carrying out of this ideal involves to the schools and to the students.

I believe in ideals—that is in their beauty, and in their utility when they do not dominate a man so as to make him a visionary, or a dangerous crank or fanatic,—but one ideal is often more or less incompatible with another, and all of them must be held subject to the possibilities afforded by surrounding circumstances. But we must not be too skeptical about these possibilities. And we are all directly interested in this matter—every one of us. Every one of this audience will

probably see the time when the knowledge and skill of the physician called in to advise in the calamity which has fallen on him, or his wife, or child, will seem to him of vast importance.

Sometimes he can select his physician—often he cannot—but must rely on the first one who can be found. Hence these discussions about medical education, although chiefly carried on by physicians, because they are most familiar with the difficulties of the subject, should be considered by those who are not physicians quite as much as by those who are, or intend to be. It is a dangerous business, however, for a doctor to discuss other doctors in public. He can make more trouble for himself in less time in this way, than by almost any other method that I know of. Nevertheless, it is my duty to tell you that there is little probability that the ideal facilities for higher medical education, either here or elsewhere, will be furnished by the doctors themselves. There are several reasons for this, but one is sufficient, and that is they have not got the money which I have shown you is necessary to provide and maintain these facilities. Hence, if these ideals are to be realized, the means must be furnished by those who are not members of the medical profession, and it seems to me that this is what will be done.

What is the best way for a university, a real university, to begin this line of work? In most cases I should say by establishing one department at a time on a proper basis. Which departments should be the first to be thus established? Just here is where many of the doctors will begin to differ.

I should say that the first of these departments to be provided for are two which will form the main links in the university bond between the medical and other departments,—covering two branches of knowledge which every university graduate should study somewhat, namely, biology, and hygiene. For the clergyman, the teacher, the journalist, and the sociologist, systematic instruction in these two branches is as desirable as it is for the physician—for the lawyer it will be useful—only the philologist would I excuse entirely from these departments.

Of course, in specifying that they are to teach,—and to teach undergraduates, I do not mean that teaching is to be their sole function. This is not the modern idea of a scientific department of a true university. It is to increase knowledge as well—to provide for the needs of special investigators and seekers who have obtained their elementary training elsewhere.

Let the plans for such a department be well thought out, the expenses carefully estimated—and then bring the matter to the attention of those who have the means to realize this ideal, and sooner or later, it certainly will be realized. I have elsewhere ventured to express my sympathy for two classes of men who have in all ages and in all countries received much disapprobation from philosophers, essayists, and reformers,—namely, rich men, and those who want to be rich.

So far as the wealthy are concerned, there seem to be a good many of them in these latter days who use their stored force to endow universities and professorships, to build libraries and laboratories, and to such let us give due praise and honor.

They may or may not be scientific men, but at all events they make scientific men possible. The unscientific mind has been defined as one which is willing to accept and give opinions without subjecting them to rigid tests. "This is the kind of mind which most of us share with our neighbors. It is because we give and accept opinions without subjecting them to rigid tests" that the sermons of clergymen, the advice of lawyers, and the prescriptions of physicians have a market value.* The unscientific public has its uses, and one of its characteristics is a liking for ideals, some of which it occasionally helps to realize. I can only hope that whenever an American university approves the ideal which I have roughly sketched, this public will see that the means are provided for carrying it out. It may be objected by some that it would be better to help to raise the average standard by endowing chairs in the medical schools in large cities, than to provide special facilities for the use of a limited number. It is quite true that all medical schools should be endowed—and this is coming;—for voluntary associations of physicians—who are

* Scientific Men and their Duties, by J. S. Billings, Washington, 1886.

not a wealthy class—cannot afford to compete with endowed schools, when State laws shall come to enforce a higher standard of acquirements. Nevertheless, we need universities properly so-called, as well as colleges and higher schools, and we need university men in the medical profession as well as elsewhere.

I have no fears as to the creation of a medical aristocracy by giving facilities for higher education to those who have the means to avail themselves of them. It is quite true that only a fraction of those who have the means will use these facilities properly—and that there will be a number who have not the means who would make good use of such facilities if they could get them—but these last will not be helped by the total absence of such facilities for anybody. Let us try to give the best minds a chance to obtain the best training—let us try to discover these best minds wherever they may be—and if their owners have not the means to avail themselves of training, let us try to furnish the means—but to do this, one of the first and most essential steps is to provide somewhere the teachers, and the buildings, and apparatus necessary for giving such instruction, and where is a better place to do this than in connection with an university?—or, if you please, in connection with this University?

Article III.—SUBSIDIES TO AMERICAN SHIPPING.*

It is a curious fact of our history that a purely economic question, vital in its commercial importance to the progressive growth of an eminently practical nation, should so often with absolute blindness to the lessons of the past be approached from a purely sentimental standpoint. That a question affecting the material welfare of the whole nation should be treated on its poetical merits rather than on the sound business basis of dollars and cents, that it should be discussed in the heat of partisanship, and be made a party measure, is in itself a matter of reproach to us as an enlightened and progressive nation.

To study intelligently the needs of our merchant marine and the conditions of its permanent resuscitation we must first of all prove and not assume the necessity and fitness of our country for the possession of a merchant marine; next study and compare the history and growth of the industry; the causes of its decay; and then in the light of our own and the experience of other nations consider the remedies to be applied.

It is a familiar axiom of Political Economy, though one frequently disregarded, that the greatest good accrues to the greatest number when all the people of a nation are engaged in those pursuits which pay best under the existing environment. There is no *a priori* reason why any nation should possess a carrying trade, a shipbuilding industry, or a foreign commerce. These industries are all distinct, and their interests, so far from being coincident, are in some respects hostile to one another. Commerce is the active principle of all, for without it a country needs neither to own nor to build ships. The carrying trade is an industry neither more nor less desirable than any other and is engaged in simply because it promises a greater reward for an equal expenditure of capital and labor. Nor even, though a nation had commerce and found the carrying trade profitable, is there any economic reason why it should

* This paper, by Ray Burdick Smith, of the class of 1891, received the John A. Porter (University) Prize, which was awarded June, 1891.

build ships. A person may prefer to own a ship built in his own country and be willing to pay for the luxury, but if this cost him more than it would in a foreign country he has lost money by the transaction.

There can be no uncertainty about the elements and conditions essential to maritime success. When all these essential elements and conditions are present, success is assured. When some are absent there will be fluctuations more or less marked and possibly ultimate decay; if any large number are absent a rapid decline is inevitable and no outside aid can arrest the working of this inevitable law.

The first condition essential to maritime commerce is a region centrally located in the midst of great seas. The flag of commerce varies with the centers of civilization and settlement and of two nations competing for trade and navigation in the great markets of the world that one will ultimately secure the greatest share, other things being equal, which is the most centrally located. A great population and a large surplus of native commodities are essential to the permanency and greatness of a merchant marine. The inevitable laws of supply and demand following closely the wants and energies of a large population must develop and insure marine enterprise. The obvious essentials for success in the carrying trade and ship building are: abundance of materials for ships; economy in construction and navigation; ability to build at a less cost than rival nations; or, in the absence of this, freedom to buy in the cheapest and best markets; wise and liberal navigation laws; absence of restrictions on trade; all these are essential to maritime success.

Have we the essentials for success as a maritime nation, and is it for our advantage to engage in commerce? We have been a leading maritime nation, therefore we must have had some of the qualities essential to success; we have had a great commerce, ship building interest, and carrying trade, and our citizens found these profitable even when the country was new and there was a greater demand than now for capital to develop its resources. Our position is one of easy access to the great markets of the world, and is becoming more central every day. Our natural resources have had an enormous de-

velopment; our population has increased at a phenomenal rate. The agricultural possibilities of the country are being rapidly taken up and developed, and the natural genius turned more and more toward trade, adventure, and enterprise. And yet with these great natural resources and activities prompting us to assume and maintain the supremacy of the ocean our merchant marine has steadily declined. It must be then in our own mismanagement, bad laws, apathy of government, or lack of special resources, that the cause for this decay will be discovered.

The building and use of ships were employments which the American colonists adopted from the very first, and before the Revolutionary War they had built up a profitable commerce not only along our own coast but also with Europe and the West Indies. The severe burdens upon the colonists which resulted from the adoption by European nations of the "Mercantile" and "Colonial" systems caused them severe suffering but in spite of these restrictions the commercial interests of the Colonies continued to grow with wonderful rapidity. Smarting under the injustice of these commercial wrongs the United States upon her entrance into the list of maritime nations asserted as fundamental principles freedom of commerce and entire reciprocity of intercourse. But the "Mercantile System" was too strong to be broken down and in 1789 in a spirit of retaliation the celebrated Navigation Act was passed which together with our tariff system still stands on our statute books as the only remaining relics of the illiberal and barbarous commercial policy of the 18th century.

In 1789 we began registering our tonnage and from that time on there was a rapid and almost uninterrupted increase in our tonnage until 1861 when we possessed one third of the tonnage of the world. In ship building there was a gradual increase until it reached its maximum prosperity in 1855, since which time it has steadily declined. But yet we must remember that this remarkable progress was much in the face of the most adverse circumstances. Beginning without the slightest encouragement from without, against obstacles seemingly insuperable, both in war and a neutrality worse than war harrassed and hindered by foreign exactions and discriminations, with

almost incredible progress these remarkable results were achieved.

The history of our foreign steam tonnage really began in 1848. Its increase was rapid, nearly overtaking England in 1851 although she had begun ten years earlier. This growth continued until 1855; since then, with the exception of a spasmodic increase after the war, it has steadily declined until the present time.

The year 1855 is the great dividing line in the history of our ship building industry and entire foreign mercantile marine. Up to this point the record is one of unparalleled progress, after this it is one of as remarkable decadence. In 1855 of the total value of imports and exports of the United States the American merchant marine transported 75.5 per cent. in 1890 only 12.8 per cent. While there has been this remarkable decrease in the business of shipping, the opportunities in this industry have increased enormously, the value of our imports and exports having more than doubled during the period. Of this enormous increase in our foreign commerce every other important marine nation has taken a share. American tonnage alone exhibiting a decrease. Of the steam tonnage built in the world Great Britian now builds about 90 per cent., and a comparison of the tables showing the records of the merchant marine of Great Britian and the United States since 1855 will show an instance of progress and growth as marked in the case of the former as has been the decline and decay in the case of our own.

In explanation of this remarkable decline many causes are assigned. One of the most common of these is the Civil War. But as has been shown, this decline began before the war, although the influence of the war was undoubtedly toward helping on the decay already begun. In modern times also the effects of war are quickly recovered from as soon as the exciting cause has passed away, and with us since the war nearly every other industry has quadrupled while this has steadily declined. The fluctuations of an irredeemable currency have also been assigned as a cause. But this is disproved by the fact that our shipping declined more after the resumption of specie payments than in the years when the fluctuations

were the greatest. It is also asserted that at the close of the war, with the revival of general prosperity so many avenues for profitable investment were opened up that there was no room left for investing capital in the carrying trade; but money has become cheaper year by year until now with our shipping at low water mark the rate of interest is but four per cent. and for standard securities even less. No one of these is a fair reason, for, as a matter of history, the first actual decline began before the war, in a time of fair interest and no debt, when money was stable.

The most direct and natural cause of this decline can be found in the initiation by England of the building of iron ships, which superseded the class of vessels that had hitherto controlled the transportation and carriage of American freights. As long as wood was the main article used in ship construction we had the advantage over England which came from cheaper material, greater skill in working it up, and greater genius and facility in management, and although we pay our seamen higher wages, the advantage of cheap material backed by American nerve and push completely won the day. But between 1848 and 1854 the conviction gradually gained ground among the commercial public that iron ships were in every way superior to the wooden ships. The moment wood was shown to be less desirable than iron in ship construction America lost the advantage she had of cheap material. England by means of her improved methods, the close proximity of her iron and coal mines, and cheap labor, could produce iron more cheaply than America, and as soon as the superiority of the iron ship was proved she at once set to work to thoroughly equip herself for the prosecution of this great industry.

The Americans, however, held fast to the wooden ship and not until 1856 when it had been demonstrated absolutely that the iron ship could do the work required by commerce more cheaply, more safely, and better than the wooden ship, did the Americans fully wake up to the fact that a new era in shipping had dawned and that they were pursuing a losing game. If at this time they had been allowed to take advantage of their rival's progress and avail themselves of the results of British skill and superiority in the construction of vessels they could

still have maintained their position in the world's carrying trade. Instead of allowing her merchants and capitalists to act without restraint in accordance with their own best judgment, and supply themselves with English ships of the most approved patterns, and share with the English the monopoly of owning and using them, America by her navigation laws debarred her citizens from the exercise of these fundamental rights and confined them to the alternative of either purchasing American built ships and so engaging in the carrying trade at a loss or abandoning the indurstry to the enterprise of their English rivals.

The inevitable decline in American shipping which went on from this point was still further enhanced by the influence of the war. At the outbreak of the war American ship owners, owing to the dangers to which their vessels were exposed, were forced to sell or transfer and sail them under foreign flags. At the close of the war Americans found themselves handicapped by tariff legislation, without a commanding merchant marine, prevented by law from registering or buying back the vessels they had transferred, and so unable to regain their marine except by purchasing American built vessels at a serious loss, while an immense country was awaiting internal development. The capital that would naturally have been applied to regaining our supremacy on the ocean was devoted to the development of internal improvements while the remnant of our once flourishing merchant marine was left to die a natural death in old age and decay.

The question of remedies is much more complicated; those proposed running the full gamut of theory from the grimmest asceticism of Protection to the wildest license of Free Trade. Those deserving of attention, however, fall into two general lines, the first advanced by those who propose to retain the present system of restrictive tariff and navigation laws and place all their faith in governmental subvention in the way of subsidies and bounties; the second, by those who regard the evil as springing solely from unwise legislation and find the remedy in the removal of the present burdens upon shipping, the repeal of the navigation laws, particularly those forbidding the purchase and registry of foreign built ships, and

the reform of the tariff so as to permit greater freedom of trade and put an end to the present system of commercial war.

We are now to consider the proposition of those who seek to revivify the American merchant marine by a system of governmental subventions and subsidies paid for the running or building of steamship lines. The subsidy system is not a new experiment with us; it has been tried several times and each time has signally failed. The opinion is prevalent, however, that the elements of failure are not inherent either in the system of subsidies itself or in the trade regulations under which it has been applied, but that if adopted now it would succeed where it has failed before. That the artificial stimulus of government support is often very useful if the industry but have the elements of ultimate success in it no one will deny. But we must remember that the system of subsidies must of necessity be a temporizing policy, for no one acquainted with the temper of the American people can for one moment suppose that they would ever allow this policy to be continued indefinitely either as to time or amount. The whole system, therefore, will be utterly worthless unless every step taken will tend immediately toward breaking down the barriers that now prevent our building and using ships as cheaply as foreign nations, and to make these industries self-supporting. If we are to be a commercial nation we must be able to run steamships in successful competition with other nations, and not be dependent upon any artificial stimulus for success. The advocates of subsidies, however, claim that such a policy would have a permanent rather than a temporary and palliative effect, and in support of such a view assert that the constant advancement and enormous development of the British merchant marine has been due to England's liberal system of government aid. We believe, however, that a careful examination of the facts will show that this view is erroneous. In holding up to us the example of Great Britain as having built up her merchant marine by subsidies, and then her vast trade by her merchant marine, they are simply parading their imaginations as facts.

Great Britain has for more than two hundred years been a founder of colonies. Before we existed as a nation she had colonies in all parts of the world of which our country was one.

She has provinces dotting the whole surface of the earth, with which it is a political, a commercial, and a military necessity to secure the quickest and most reliable connection possible by postal, naval, and all other available means. She is conspicuously open to aggression from other nations, and to difficulties within her own domains; hence certainty of communication is an essential means of defense against the weakness of a widely scattered empire. At first this service was done by the use of her naval vessels, later by a government-owned packet service; but it was soon found that a much cheaper, swifter, and more efficient service could be secured by giving contracts to the lowest bidder among her merchantmen. And this she is now doing.

At first upon the establishment of her steamship lines they were naturally much more costly than they are now. The possibility of steam navigation on the ocean was first demonstrated about 1838. From that time until 1851 the question as to whether it could be made profitable or not was extremely doubtful. England saw at once that if success were attained the military and political advantage which would accrue to her would be enormous. She therefore made liberal offers of subsidies in order to induce capitalists to invest in the risky enterprise and make every effort to secure a successful solution of the problem of ocean steam navigation. With this encouragement the Cunard line was established, and by 1851 the success of steam navigation had been fully demonstrated. It was then that Mr. Inman started a competitive parallel line entirely independent of the government and it was only the first of many competive lines that have been run successfully without receiving the slightest assistance from the government. That this was possible shows that the subsidized lines received only a fair remuneration for the service rendered, otherwise they would by competition have forced the Inman and other non-subsidized lines out of business. That the government had no intention of paying more than a fair price for the services rendered is shown by the spirit exhibited in the parliamentary investigation of 1859-60. The admiralty had been charged with extravagance and partiality in making the awards. The defense was offered that its excessive outlays had been the means of en-

couraging commerce and creating a merchant marine which would be available in case of war. Parliament, regarding the excuse as insufficient, transferred the ocean mail service to the Post Office department, and opened the entire service to public competition by ships of every nationality. This is the English system. The government pays the commercial price for the services rendered, and this price is determined by competition in open market without distinction as to the nationality of the competitors.

In considering the English system it may be well to notice briefly the experiences of some of her more important lines. As we have stated, in 1851 the Inman line entered the field as a rival of the subsidized Cunard line and five years afterward it had become so successful a competitor that it carried over one-third of all the passengers across the Atlantic and charged a steerage rate of five dollars higher than any other line. Private enterprise shows itself in the fact that this was the first trans-Atlantic line to make use of screw propellers. The line was remarkably successful and this success was due to individual energy and good management unassisted by external aid. The National Steam Navigation Co. soon after also established a rival line to New York which was very successful and was unsubsidized.

In sharp contrast with these is the experience of the Galway line to New York. Although heavily subsidized it seems to have been badly managed from the first, the management relying not so much on the business returns as the subsidy for profits. The line ended in a failure which caused severe losses both to the shareholders and the public. Another of the first lines to be established was that of the Royal Star Packet Co. in 1841 to the West Indies. It was heavily subsidized and owing to the inexperience of the managers at first suffered some losses and was kept afloat only by a reduction in the requirements and increase in the subsidy. With increased efficiency in management the returns increased and in 1850 paid a small dividend. Between 1850 and 1882 the contract was renewed seven times and in each instance there was a reduction of the subsidy and a marked increase in the mileage and rate of speed required. The ships were also required to be built so

as to carry heavy guns, and rendered important service during the Crimean War.

Closely analogous to this is the history of the Peninsular and Oriental Co. This company started in 1825 as a small shipping venture. By uniting industry and economy they attained success and in 1837 offered to carry the Peninsular mails in less time and at less cost than the Admiralty packets which then performed the service. The government rejected the offer, but the company by the regularity and speed of its vessels attracted so much attention, and the public complained so loudly of the inefficiency of the packet service, that at last the Admiralty was obliged to request the company to submit plans for mail service. This the company did, but before the government would accept them it invited public competition on the plans thus submitted. Another company made a more favorable offer and received the contract, but it soon failed and the government was forced to make the award to the Peninsular and Oriental Company.

Thus in 1837 when England was trying to establish ocean steam navigation, and when if ever she ought to have been most generous in making appropriations in the way of subsidies, so far was she from doing this that she refused to make a contract with the company until coerced by public opinion even though it was clearly to her advantage to do so. This proceeding was almost exactly repeated when the company secured the mail service to Alexandria, India, and, after the Crimean War, in which their vessels served as transports, to Australasia. In all instances the contracts were never renewed without inviting public competition and imposing new and onerous conditions. Not only were the requirements as to speed and machinery very stringent but also heavy penalties were imposed for even the slightest delay or infringement in the contract. In addition the Admiralty could at any time require alterations in plans, and provisions had to be made for the transportation of civil and military officers, baggage, and military stores without extra charge. The vast establishment maintained by the company, the important and onerous duties performed, between stations far apart and many thousand miles from headquarters, involves an outlay so great, embraces a risk

so hazardous, and conditions of contract so stringent that it seems to be questionable whether the company receives an equivalent for the services rendered.

So far from the government's encouraging the company by subsidies, Mr. Lindsay expresses the opinion that the shareholders would have made more money had they never carried a mail bag in their steamers. He says: "Though the annual gross receipts of the company are enormous, its expenditures are so great that less balance is left for the shareholders than is usually divided among those of similar undertakings which receive no assistance from the government, but are free to employ their ships in whatever branch of commerce they can be most profitably engaged."

The evidence seems conclusive that England has never appropriated public money for the sole purpose of encouraging shipping, and to claim that her merchant marine has been created, fostered, and maintained by government aid in the way of mail subsidies is simply ridiculous. Only about two per cent of her total tonnage are in the employ of the British post office department, all the rest of her marine are unsubsidized, receiving no government aid in any form. Of the British lines to New York only two, the Cunard of five steamers, and the White Star of seven steamers, receive postal payments, the other eight lines with a fleet of ninety-two steamers receive no money whatever from the British government.

The British post office, instead of paying liberally as is pretended, makes its contracts as close as possible, so close in fact that English lines have refused them, the North German Lloyd, for instance, having underbid its English rivals several times. England's whole postal service, both that in Great Britain and throughout the world, including all so-called subsidies, is not only self-supporting, but, unlike ours, yields a surplus of several thousand pounds. The English post office so far from being a commercial nursery is quite the opposite, the sole consideration being economy consistent with efficient service.

While England gives government compensation to only two per cent. of her ocean marine, she has no difficulty in coping

with France on the high seas although France has purchased many English ships at the lowest cost, has cheap and highly skilled labor with the cheapest attainable material in her own shipyards, and gives a tonnage subsidy to her shipping such as it is proposed to give our own. This shows that England's commercial success is to be attributed to something more far-reaching than any subsidy system, and is to be found rather in the character of her trade regulations which are at the basis of, and which condition the success of all marine legislation. England is first in commerce and is consequently first in shipping; and she became first in commerce by removing the restrictive laws which burdened her commerce and made war against trade.

Going further into the field of experience we find that France, Spain, Germany, Austria, and Italy have, within the last few years spent immense sums for the development of their sea-going tonnage by a carefully devised system of subsidies and bounties; and yet not one of them can present results that justify their expenditure. France has taken the lead in adopting the most liberal and undisguised subsidy system ever introduced, and it is to her that we look to find the magnificent results which the subsidy supporters declare must necessarily follow the adoption of such a policy.

Previous to 1881 the commercial experience of France had been similar to ours. Thoroughly in touch with the doctrine of the mercantile system, France had in 1793 passed navigation laws almost exactly like our own. This policy had its natural effect of thwarting all growth, her tonnage being several thousand less in 1856 than in 1793. Then a more liberal policy was adopted including the registration of foreign built ships and the removal of all taxation. Before this enlightened measure had an opportunity to prove its value the ship builders raised such a clamor of opposition that restrictive legislation was again inaugurated. Alarmed at the continued reduction in their merchant marine the French at last passed the bounty act of 1881. By this act the subsidy is granted in two forms, a tonnage rate for the building and a mileage rate for the sailing of vessels, the mileage rate of French-built vessels being double that of vessels built abroad but sailed under the French flag.

Consul General Rathbone's report shows the state of affairs up to 1887. After six years' trial of subsidies based upon construction and distance sailed, the French government now finds its merchant marine in a deplorable condition. At first construction began rapidly in both French and English shipyards. New lines of steamers were organized and the supply of tonnage increased enormously. This looked like prosperity indeed. To be sure most of the ships were English built, but what mattered it as long as they sailed under the French flag! But trouble soon began. The payment of the subsidy proved a serious burden to the taxpayers, and furthermore they found that the increased number of ships did not increase French commerce by opening up new markets as had been predicted, but simply increased the competition for the transaction of what trade already existed. A reference to the tables will show that the value of the foreign trade of France in 1888 was nine and one-half per cent. less than in 1883. The ships merely floated the French flag and secured the bounty. The foreign commerce of the country could not increase because their restrictive trade regulations would not permit it. The French wanted their flag to wave in the ports of all nations. They secured the luxury and paid for it. Many companies however sprung into existence which were forced to rely for returns solely on the French trade. The increased competition soon rendered the running of these unprofitable, and they went to pieces. This decadence has continued, and in 1887 the tonnage was less than in 1882, and even less than that of 1860. If the liberal subsidy system of France has failed either to increase her tonnage or open up new markets for her domestic products, is it not pertinent to ask if the ten millions and more she has spent in the attempt to increase her marine has not been thrown away? The only noticeable effect has been to create more ships than were needed without in any degree expanding the nation's commerce while the payment of bounties has entailed a loss upon the nation by throwing upon it the burden of sustaining a shipping interest which, without government aid, would have been unprofitable, and because of such aid cannot conform itself to the demands of trade. Mr. Raffalovich, the English Consul at Bordeaux, in his report

says: "The subsidy system of France, which was intended to bridge over a temporary depression, has aggravated the situation, and has proved itself to be a mischief not a cure."

Until very recently Germany has always pursued the enlightened policy of absolute non-interference on the part of the government with its merchant marine. From the time of the union of the States in 1871 the German marine has had a steady growth and now assumes large proportions. This result has been reached solely through the individual energy and enterprise of her citizens without any encouragement from the government whatever. The free importation of foreign vessels has always been permitted. From the repairs thus necessitated shipyards have sprung up and now they compete with England in ship building from whence they were formerly wont to buy.

In 1885, impelled partly by military and political reasons and partly by the belief that more extended lines of communication would open up new markets for German manufactures, new steamship connections were established with Asia, Australia, and the Levant. A subsidy of a little over a million of dollars was voted the German Lloyd Company for the purpose. The result commercially considered has proved an utter failure, but has been highly satisfactory regarded from a military and political standpoint. The fact that the line has since tried to cancel its contracts shows that it has not proved a profitable investment for the company.

Soon after the adoption of the subsidy system by France a similar movement was started in Germany by Bismark. Nothing shows the sentiment of those interested in German shipping interests as well as an extract from a protest to the Reichstag by the Hamburg shipping merchants at that time: "Even if the French government should extend larger monopolies and subsidies to their national trade and commerce, the Hamburg shipping merchants are not afraid that if let alone, their own development would be injured or suffer under such legislation. The growth and prosperity of national trade are before all created by the national talent and disposition of the people. Governmental measures, whether they consist in throwing artificial obstacles in the way of foreign competition,

or in direct support of the national flag, may here and there bring temporary advantage to individual enterprises, but they will never be able to permanently raise and elevate the shipping interest. On the contrary as experience has shown in France, they paralyze individual energy, endanger the spirit of enterprise, and effect the decline if not the ruin of trade. In the interest of German commerce, and of the national flag, the Hamburg merchants most earnestly and respectfully pray that all governmental measures for their protection be set aside."

Such has been the experience of European nations with the system of subsidies. Let us turn now to the history of our own experience and see if any better results have been attained.

As early as the Twenty-seventh Congress resolutions were introduced favoring subsidy legislation. Nothing however was done until 1845, when an act was passed authorizing the Postmaster General to contract for the transportation of mails between the United States and foreign ports. Under this act contracts were made with a line from New York to Havre, which run twelve years and failed, and a line from New York to Southampton. The latter met with serious misfortunes and finally ended by chartering its steamers to the government at the outbreak of the war.

The most important subsidy granted before the war was to the famous Collins line in 1850. This line was started from the national emulation of running the "Cunarders" off the Atlantic, and a subsidy of over five millions of dollars was granted. The company was unable to get its vessels completed within the stipulated time and an extension of time was granted. The cost of the steamers exceeded the estimate, so the government advanced money and increased the subsidy. In return for these favors the company yielded to the prevalent insane desire for a high rate of speed and agreed to make the fastest passage across the Atlantic. The performances of the Collins steamers seemed at first to justify the expenditure. They made exceedingly quick time, though with what danger and financial result to the owners, the public did not seem to care.

The competition between the Cunard and the Collins line was spirited, until in 1854 the first disaster overtook the latter in the loss of one of its steamers in a collision. Two years later another was lost at sea. The company had begun with a heavy debt and the immense outlay necessary to attain the required speed together with the losses sustained were too much for the company. The shareholders declined to furnish any more capital, the Collins steamers were withdrawn and the ruinous and costly experiment was abandoned.

The most important lines subsidized since the war have been the Garrison line to Brazil and the Pacific Mail to China, Japan, and the Sandwich Islands.

In introducing the Brazilian subsidy bill, Mr. Alley said: "Establish this steam communication with South America, and you will not a great while longer see England exporting $28,000,000 worth of merchandise and taking in return less than half that amount; and the United States exporting only $6,000,000, while the import of Brazilian products is over $20,000,000." The bill passed with little opposition, and the law went into operation in 1866. Speaking on the Pacific Mail subsidy bill, Mr. Alley also declared that on nearly all the products of China, India, and Japan, this line would give us the carrying trade of the world. Mr. Cole speaking on the same bill said: "It is as certain as demonstration can make any fact, that the expenditure will be returned many fold in duties on increased importations, and that too from the very start. And then the trade will increase from year to year, almost in arithmetical progression, until not only our expanding Republic, but the whole world will be supplied through American merchants with the products of the land of Confucius." No opposition was proof against such an irresistible argument as that, and the line went into operation in 1867. Trouble soon arose, however, for the Pacific Mail desired to be relieved of a part of the required service. This assistance was readily granted, and in advocating it Senator Conness said: "Our experience in subsidizing American lines has not, I concede, been encouraging; but it is our pride to make this a success, to make it a success that will challenge the admiration of the world."

In 1872, a bill was introduced to double the Pacific Mail subsidy. In the debate on this bill Mr. Kerr characterized the arguments for subsidies as "the old and pretentious prayer of the few, the aggregated wealth of the rich corporations for extorting contributions from the people." "These contributions," he said, "are for their own individual pecuniary benefit. The country will gain nothing by them, commerce will become no cheaper." The bill passed in 1874, but before the company was ready to begin service under the new contract, a scandal had come to light which showed that the company had spent over a million dollars to secure the subsidy. Several members of Congress were found to have accepted bribes and others were suspected. The matter was hushed up as soon as possible, but the struggle for subsidies had received a blow from which it has only recently recovered.

What were the results obtained by this system of subsidies? Did our trade increase in arithmetical progression, and did we secure the carrying trade of the world in the products of China and Japan as was so brilliantly predicted?

In 1873, the subsidy to the line between San Francisco and the Sandwich Islands ceased by the action of the company in withdrawing its steamers. The line had existed six years and cost $425,000. Our trade with the Hawaiian Islands during the period was as follows:

	Imports.	Exports.
1867	$1,070,252	$864,492
1873	1,275,061	674,191

Showing a loss of $200,000 on exports and a gain of $200,000 on imports. In 1875, the Brazilian subsidy expired. This service lasted nine years, and cost $1,500,000. Our trade with that country during the period was as follows:

	Imports.	Exports.
1866	$16,816,803	$5,691,659
1875	42,027,863	7,742,359

The development of the import trade was mainly due to the removal of the duty on coffee and rubber. The imports from Brazil, in 1875, included coffee to the value of $35,099,274 and rubber to the value of $2,519,437. In the two years following the withdrawal of the Garrison line, and without any

subsidy, our average annual exports to Brazil were $7,763,596, slightly more even than when burdened with the subsidy, thus showing that our manufacturers gained nothing by the outlay. England's exports to Brazil during the same period increased in a much greater ratio showing that her superiority rested in causes too deep and potent to be neutralized by mere subsidies.

In 1876 the first contract with the Pacific Mail Company expired. The second for obvious reasons never went into effect. The subsidy paid amounted to $4,583,333.32. The effect of this in our trade with China and Japan is shown below.

CHINA.

	Exports.	Imports.
1867	$3,578,808	$12,112,440
1876	4,729,892	12,947,633

JAPAN.

1867	$712,024	$2,618,283
1876	1,099,696	15,470,047

Of the value of the imports from Japan in 1876, $10,426,531 represented tea, and $3,787,417 raw silk, from both of which the tariff had recently been removed. The increase in the exports to both countries did not amount to one-half the subsidy paid. The only changes in our trade regulations were with those countries from whose products we had removed the tariff. The removal of the duties brought a marked increase in the amounts imported of the products put on the free list. In all cases the increase in the exports was insignificant in comparison with the subsidies paid and resulted naturally from the increased imports. This is proved by the fact that our exports increased with all those countries from whose products the duty was removed, and no such increase resulted in the exports to the countries with which our tariff relations remained unchanged. The subsidy system was here given a fair trial and failed to benefit the business community in the least, and more than that it resulted in one of the greatest scandals that has ever disgraced the legislative record of the nation.

In 1879 the Brazil subsidy scheme was again revived, and in opposing it the Hon. J. Q. Cannon tersely summed up our

subsidy experiences as follows: "Beginning with the year 1847 down to the present time we have paid out of the Treasury over $21,000,000 for the purpose of establishing steamship lines. $7,000,000 would buy all the steamship lines engaged in commerce that sail under the American flag on every ocean in the world, and more than that, the subsidizing of these steamship lines from the Collins line in 1850 up to the present time has bankrupted every prominent man that has favored it." This statement carries much more weight with it now when we have expended $34,000,000 in subsidies, while the value of our steamship lines has steadily decreased from that time to this.

Such has been our experience with subsidies. The history of the past in every case where subsidies and bounties have been resorted to as a means of rehabilitating a declining merchant marine has established the fact that the remedy is a failure. At three different times we have given them a fair trial and three different times have we abandoned them. Every time, or at least twice, our Congress was disgraced by the efforts put forth by the subsidized parties to maintain their hold on the government bounty. This struggle has always been and always will be desperate, a hard death struggle, because necessarily all the shipping that comes into existence as the result of subsidies must have them continued or die. What else but disgrace has been the result of our experiments? Did we build up our trade with China? Did we build up our trade with Brazil? Did we build up our trade with Japan? Have we built up our commerce with any nation? If there was any period during which we were losing the carrying trade it was that of our first experiment with subsidies, and in spite of the attempt to check this decay by the revival of that system, it has continued ever since. It must be admitted that if we subsidize everybody and put plenty of money into the hands of our ship owners we can build up a merchant marine just as we can raise oranges in Alaska by appropriating money enough to keep them under glass and supply them with steam heat, but the artificial stimulus must be continually kept up, for the moment it is stopped the hot-house products will wither and decay.

Barring all sentiment let us study the subject of subsidies from a business standpoint. The questions naturally arise: Why are subsidies needed? Whom will they benefit? Who has to pay them? What result can they effect?

The immediate object of subsidies is said to be to *build up* a merchant marine. The question naturally arises what is the use of having a merchant marine? The answer usually is, to develop our commerce. Allowing for the moment that the mere possession of ships will develop our commerce, if this is the ultimate object to be attained, the natural conclusion would be that what we want then is to *have* a merchant marine. If what we want is simply ships, obviously the way to supply that want is to get the ships, and whether we build them at home or buy them abroad makes no difference as long as we have the ships. But this wouldn't leave any place for subsidies. The subsidist wants us to have a merchant marine, but to secure it in his particular way. There is something peculiar about our shipping and commerce; it is only American built ships that will develop our commerce. The aim of the subsidist, therefore, is to have a merchant marine, provided we build it. In plain English the subsidies are given solely for the benefit of the ship building interests.

At the present time on account of the greater cost of material and labor it costs from twenty to thirty per cent. more to build a ship in the United States than in England. The American government by its navigation laws refuses to protect its citizens' property if invested in ships unless these are American built. It has been found by experience that Americans will persist in investing in foreign built ships and sailing them under foreign flags, even under the necessity of allowing these foreign powers to use them against their own country in case of war, rather than submit to paying the extra amount demanded by American ship builders. Such lack of patriotism is undoubtedly lamentable but nevertheless it is a fact, and is likely to continue so long as human nature remains as it is. Although Congress has been legislating on fiscal matters for the last fifty years on the basis that human nature isn't as it is, the only noticeable effect as yet is that which usually results from acting upon a false assumption. The only way then to

induce Americans to invest in American built vessels is to make up to them the difference between the cost of building ships at home and abroad, and this is what it is proposed to do by the aid of subsidies.

If we question further as to why we need to build up a merchant marine, we will meet with the answer that it will furnish a grand field for the investment of American capital. It will give us the profits on the immense carrying trade of our own country and such a part of the carrying trade of the world as we can command. It will educate and train a vast number of our citizens as seamen to aid in carrying on the commerce of the country if need be in time of war. It will also furnish a most valuable naval reserve, a contingency for which we are making no preparation, as our merchant marine is fast passing out of existence. This may all be very true, but it has nothing whatever to do with the question of subsidies. All that can be gained in the interests of our marine or navy by subsidies can be gained simply by admitting foreign built ships to American registry. There is no principle involved in the question whether a ship that carries the American flag ought to be an American built ship or a foreign built ship. That is simply a matter of commercial convenience and to the advantage of our merchants. The contribution to our commercial strength is just the same in one case as the other. The loyalty of the ship is just the same, her means for transporting commerce are just the same; and there is nothing connected with the idea that a foreign built ship cannot be entitled to an American register except the mere fact that we want to build up yards and facilities for building ships on our own shores. That is all we gain by our resort to a rigid principle of this character. There is no philosophy in it; no political economy or wisdom in it except the mere encouragement of our shipyards. Another argument in line with this is that we must keep up our shipyards with a view to their utility in case of war. With regard to this it is only necessary to say that at present we have eight government shipyards, many more than we need, worked to not one-quarter of their capacity, and furthermore, the government shipyards for the building of government vessels will not be influenced by any legislation on

the subject of subsidies. The subsidy scheme therefore is simply a bold, naked, undisguised proposition to levy a tax upon the American people, upon the laborers, the merchants, the farmers, in aid of an industry carried on by rich corporations. It is a stigma and reproach upon our much vaunted American freedom, justice and equality that our legislative body should have ever entertained for a moment a proposition like the recent bill to tax the great body of producers of wealth in America to make remunerative an unprofitable business like shipbuilding carried on by a very few. And yet it is this kind of unwarranted class legislation that the American people have submitted to during the last quarter of a century. The power to tax even when moderately exercised is severe and onerous; but when exerted to prevent or obstruct importations in order to enable home manufacturers to compel higher prices, or build up some favored industry, it becomes an engine of rank injustice and oppression. The result is nothing more nor less than the coerced transfer without compensation of the property of one citizen to another. Justice Miller of the United States Supreme Court laid down the true doctrine when he said: "To lay with one hand the power of the government on the property of the citizens and with the other to bestow it upon favored individuals to aid private enterprise and build up private fortunes is none the less robbery because it is done under the forms of law." A very large proportion of our people are engaged in agriculture. It seems that this policy of class legislation is based upon the idea that those engaged in agriculture being a majority of the people, holding large capital and ownership interests, producing large amounts of commodities, furnish the field from which to draw wealth for the benefit of the class interests of the country. This has been the assumption in all our tariff legislation, and the subsidy scheme rests upon this same idea of supporting a class from the Treasury and putting our shipping like our manufacturing interests upon stilts, and leaving the agricultural interests of the country to support both.

We have been constantly urged to tax ourselves for the protection of our manufacturers because it is said by encouraging manufactures we are making home markets for our agricultural

produce. And yet with all our manufacturing establishments, with all our high rates of duty, with all our exclusion of foreign commerce from the country, after supplying our own people with agricultural produce we have some $500,000,000 worth annually that must be exported or rot without use. What we need is more extensive foreign markets and cheaper transportation rates. The farmer has been beguiled with the alleged advantages of the "home market" until his farm is mortgaged and he has become debt-ridden, discouraged, and disgusted with the whole policy of protection which creates a privileged class of the few at the expense of the many. We look in vain for any possibility of subsidies cheapening transportation rates. In fact in the very same breath in which the subsidy is asked it is declared an impossibility to lower freight rates, that they are low enough now and perhaps too low. The subsidists say: "At the rates of freight charged by other nations who buy their vessels from 20 to 30 per cent. cheaper than we do, some of whom are subsidized, we cannot afford to give the cotton and wheat shipper as cheap rates as they do. In order to live we must have a higher rate of freight. We cannot get it out of the people. We cannot compel a man to ship his cotton under the American flag when he can get a lower rate of freight upon a vessel that is owned in England, Germany, France or elsewhere. Not having this power to secure an advanced rate of freight we simply ask you to subsidize the ship builder so we can purchase ships and compete on the same terms as others, or, what amounts to the same thing, compensate us for the difference in freights." It is just as if the wheat growers of the West were to say: "We cannot compete with India in growing wheat. Since it is a great consideration for the United States and the world that our wheat crop should be grown and marketed, the government should make up the difference between the cost of growing wheat here and in India out of the Treasury." If subsidies are to be granted upon the ground that the business of navigating ships does not pay without government aid, those who engage in farming, and all other industries as well, have as much right to demand government aid in the way of subsidies on their products in order that their industries may become more profitable. If we

once begin this subsidy system, admit the principle of government aid, it will be impossible to find any one industry from the building of a steamship to the catching of a codfish that can be carried on without the aid of government bounties imposed upon the people.

The mere construction of vessels in which to carry our products, is not commerce, it is not trade. It is simply an industry like any other, and is subject to the same conditions. To build up a great nation we must seek to promote not only our manufacturing but also our agricultural, commercial, and trading interests, so far as our natural advantages in these industries will warrant. It is as unprofitable for us to select one industry and promote its growth by artificial appliances at the expense of others as it is unwise to take one member of our bodies and advance it to great strength and power when by so doing we sap the foundations of our physical existence. Again, even within the system itself, unless all competing lines are subsidized great injustice and injury is done. The subsidizing of single lines instead of promoting will retard the growth of our merchant marine by excluding all possibility of competition on the part of unsubsidized lines. The result will be either to tax the people for the purpose of giving a few lines a monopoly of the carrying trade, or else subsidize all lines indiscriminately at the expense of a bankrupt treasury and overburdened tax payers. We can expect no permanent success of any enterprise that is led to look to the public treasury for support. The giving of subsidies is apt to open the flood gates to more such raids upon the Treasury and place our government in danger of becoming a vast jobbing concern. Subsidies, like all other forms of government assistance to private enterprise, are far more likely to prove to be premiums on incapacity and laziness than of any permanent service to the public. This policy throttles individual enterprise, removes all incentives to industry, and as a permanent system would be a curse to the thus favored industry as well as a curse to the nation.

There is one fundamental fallacy which underlies all this commercial legislation, viz: that it is possible to develop commerce by simply increasing our merchant marine. It was upon this principle that France acted and failed. It was upon

this principle that we have just placed upon our statute books a duplicate of the French law which will undoubtedly produce just about as satisfactory results. It is a familiar maxim in the intercourse of nations that it is impossible for any nation by subsidies or money to purchase commerce, to buy the control of the ocean. It cannot be done. Commerce springs from human wants, the demands of society and civilization, is governed by the natural laws of exchange of supply and demand, and shipping will spring into being to carry on all such commerce under free and equal laws. The mere plowing of the ocean with subsidized ships is not commerce. Something more is necessary than ships; we must have merchandise, we must have products, we must sell as well as buy. Foreign commerce must always in the main consist in an interchange of commodities. If you want to carry on a trade with a people you must buy from them as well as sell to them; and by the inexorable laws of trade our foreign commerce can be developed only as an ability to induce foreigners to buy from us and our willingness to buy from them are increased. In just the proportion as buying or selling or the exchange of products is restricted, to just that extent is the necessity of having ships the instrumentalities of trade diminished. The protective system carried to its logical conclusion means the destruction of all commerce. Its avowed object is to make within the United States all that the people of the United States want and buy nothing from any foreign country. It is recognized that the present pressing necessity of the United States is extended markets for the continually increasing surplus of our products. But such markets cannot be obtained or a national marine find a basis for growth, or even existence, so long as we restrict our producers from freely exchanging their products with the products of the producers of other countries.

The protective system says we shall not buy, the avowed object of the subsidy system is to aid in selling, and it is to do this by establishing new lines of communication on the principle that trade will follow the flag, that ships are the parents not the children, the cause not the effect of commerce. Not only do the rules of common sense, and the laws of trade prove the assumption to be false, but a careful study of our

own commercial experience will show that commerce will not follow the flag, but that the flag will follow commerce. The flag will follow interest and until we make it the interest of the people of foreign countries to export to us and buy our exports, they will never follow any flag but the flag that puts money into their own pockets.

The greatest solicitude has been and is being shown with respect to the more rapid extension of our commerce with the Central and South American States. The yearning for this trade is most reasonable and natural. Our continental relations with these countries, the similarity of our institutions, the dissimilarity of our products, all seem to indicate that an active interchange of commodities should still further serve to bind us together. Heretofore the effect has been confined to the granting of subsidies to steamers plying between the United States and those countries. That these have all failed of their object it is unnecessary to state, and yet in his report on the Pan-American Conference Mr. Blaine urges very strongly the establishment of more lines of communication with these countries. In this connection a glance at the statistics of 1889 may prove instructive. We find that during that year, of the 2,671 vessels that entered our ports from these countries 1,173 were of vessels in ballast showing that no cargoes could be had in the Central and South American ports from which they respectively sailed for their ports of destination in this country. Of the 2,144 vessels cleared from our ports for the ports of Central and South America 100 cleared in ballast. All this shows that there is no lack of vessels for this Central and South American trade but rather that there is a scarcity of attainable cargoes for the vessels we already have. And since transportation by vessel, like transportation by rail, in order to be profitable must secure cargoes both ways we can see there are already more vessels engaged in this trade than can be profitably employed. We now have American lines of transportation from the United States to Mexico, the West Indies, Brazil, Venezuela, China, and Australasia. It would seem as a matter of course that these lines should have induced trade to follow them. A glance at the statistics shows that with only one of these countries do our exports show any material

increase during a period of seven years, from 1881–1888. While on the other hand we have been without any regular steam connection with the Argentine Republic and have been reduced to the employment of tramp steamers and sailing vessels for our intercourse with that nation, yet our export trade to that country almost trebled during the same period. It is also worthy of note that for many years we have had an almost perfect mail service with Europe, running with extreme regularity, and remarkable speed, supplemented with all the advantages of a perfect exchange market, and adequate telegraph system, and although during the same period the means of communication with South and Central America has been so imperfect, and, as Mr. Blaine would have us believe, so entirely inadequate, yet our import trade from Europe increased from 1860 to 1889 86 per cent. while our import trade from Central and South America increased in the same time 164 per cent. During the same period our export trade to Europe increased 137 per cent. while our export trade to South America increased 135 per cent. Do not all of these facts show that it is not owing to the want of ships that we have not realized our ambition with respect to the South American trade? And that we might have ships under the impulse of heavy subsidies sailing regularly between every port of the United States and every important one of Europe, Africa, and the Americas and still our commerce might languish?

For a great and healthy commerce to exist between any two countries, the products of each must be wanted by the other, and there must be between them a mutual ability to buy or exchange as freely and as cheaply as with any other country producing like commodities. As we learn by every day observation, people will buy of those to whom they sell if they can procure of them what they want as cheaply as of any one else. This is true to a greater degree of international trade, where the great markets of the world are far apart, so that to sell in one and buy in another would involve great loss of time and money, would prevent merchants from utilizing bills of exchange, and would so involve the additional inconvenience and expense of making up the difference between exports and imports by the shipment of specie. International trade is

therefore one of barter; but there is a limit to this rule. When the sellers find that by shifting their purchases to some other market than that in which they sell, they can make more than the extra expense involved in the action they will at once divert their buying to that market. These are the inevitable laws of trade for they are founded upon that regard for self-interest which is a fixed principle of human nature. To suppose that any country will disregard these laws is a degree of folly which would only be surpassed by the actual disregard of them by any people.

The movement for the subsidizing of ships has its mainspring in the manufacturing interests of the country, the agricultural classes have opposed the system from the beginning without exception.

Our tariff system which is maintained solely for the benefit of our manufacturers after thirty years of full swing has been eminently successful in its avowed object of checking imports and has naturally failed in providing any large addition to the exports of the country. And now after the American people have set these men up and maintained them in business by taxation they naturally resent the demand made by them for additional money to carry their goods to foreign markets.

But suppose our manufacturers want to export their products, where will they export them to? They cannot, they say, come into competition with European goods in our own country with the freight across the Atlantic, insurance, and other costs of transportation added, and so by the McKinley bill we have granted them protection to the amount of 61 per cent. in order to enable them to compete with foreign goods in our markets. How then can the American manufacturer send his goods across the Atlantic and with all the costs of transportation added compete in Europe with the very foreign goods which he says he cannot compete with here without this protective tariff. With our present tariff system it is an absolute impossibility to extend our commerce materially with any country. For instance, 61 per cent. measures the difference between the cost of our goods and those produced across the water, and so they will not buy of us. We have no power to compel Brazil or any foreigners to buy high priced goods of us. We have the power to compel our own people to do it

and unfortunately we exercise it. But inasmuch as these South Americans are not under our laws they buy their goods where they can get them cheapest.

We deny our manufacturers the benefit of free raw material which would enable them to compete with foreign manufacturers, then increase the tariff so as to fully secure them in the possession of the home market. This economic system has not only rendered it next to impossible to export our manufactured products to other countries, but most naturally has reacted upon the agricultural interests of the country. It has forced Great Britain to loan or lay out hundreds of millions of money to open up new sources of supply of breadstuffs and dairy products in India, Australia, New Zealand, and the Argentine Republic. And in the case of Chili and the Argentine Republic, because they must be supplied with breadstuffs which we will not exchange with them for their wool, coffee, and copper ore, the people of these two countries are embarking with great success in dairying and the raising of wheat.

Thus not only our manufacturers but also our agriculturalists are being walled in by our extreme protective system from the benefit of foreign markets, while the home market is becoming constantly more and more inadequate for their relief. The great difference between these two classes is, that the manufacturers have a great and powerful protection in the law of the land which it seems they can get altered for their benefit by the asking, while the farmers have no such protection and unfortunately are exposed to all the hardships which law inspired by selfishness can impose upon them. We have made tariff laws which prohibit foreigners selling to us, and when these tariff laws work out their legitimate effect in a destruction of our foreign commerce and carrying trade, we propose to tax the American people to furnish the means for carrying in American bottoms the foreign trade which by our tariff laws we say shall not be carried on. We destroy foreign commerce by unjust and onerous taxation levied on the American people. Having done this, seeing the devastation committed by our folly, we attempt by a system of subsidies and bounties to undo the wrong by imposing more unjust taxation upon the people.

Ships are the children of commerce not its parents, the instrumentalities of trade not its origin. The primary object to be attained is not so much the business of ship building as that of first extending our commerce and then regaining that share in the immense and profitable carrying trade which we formerly possessed and to which we are justly entitled as a leading nation of the world and which we must possess if we would enjoy in security sufficient markets for the produce of our industries, relieve the overproduction from which we are suffering, and secure for our labor sufficient opportunity for profitable employment.

If we are to become a commercial nation and again take the lead in the world's commerce we must break away from the restrictive policy of taxation and pursue rather the policy of all other enlightened nations of removing all burdens pressing upon our foreign commerce which are the result of unwise legislation, give our people the freedom of purchasing in the markets of the world on terms that will enable them to put the American flag over a well-equipped convertible merchant marine, and gradually break down the barriers imposed by a high protective tariff which destroys all commerce and isolates us from the world.

Instead of seeking to foster an unprofitable industry by the artificial stimulus of government aid, the only result of which is to "paralyze individual industry, endanger the spirit of enterprise, and effect the decline if not the ruin of trade," to use the language of Webster, rather teach our ship owners "not to depend upon protection and bounties but upon unwearied exertion, unshaken perseverence, and that manly and resolute spirit which relies upon itself to defend itself." Give American pluck, enterprise, and skill, unhampered and unchecked, their rightful opportunity and legitimate sway, and their triumph on the seas will be as grand and signal as have been their victorious achievements in other lines of endeavor.

Those who advocate subsidies are continually clamoring for the adoption of the English system. Let us adopt the English system. England tried restriction, protection, and exclusion until starvation and discontent amounting almost to revolution compelled her to abandon her unprofitable restrictive policy.

She removed taxation from her labor, cheapened the food, clothing, and all the necessaries of her workmen, shortened their hours of toil, threw open her ports to all competitors, put her people on their manhood and their muscle, and declared her policy to be free trade, free ships, free seas, and equal rights to all men in honest competition for the world's commerce. Under that policy she has forged to the front and now holds undisputed sway as the first commercial and industrial nation of the world. But give to our people natural freedom of trade and exchange, and our vast capital will immediately seek investment in the instruments of commerce, and our commerce and exchanges with both foreign nations and among our own people and states will at once begin to spring into renewed life, energy, and power, and the American flag will soon be witnessed on every sea. What our people want to reëstablish our commercial marine in vigor and prosperity is simply freedom.

U. S. shipping in foreign trade; its growth, thrift, and decline.

Years.	Tonnage in foreign trade. Tons.	Tonnage of vessels built. Tons.	Shipping per capita. Cub. ft.	Commerce per capita. Dol.	Per cent. of U. S. carriage in foreign trade. Imports. Per cent.	Exports. Per cent.
1848	1,344,819	------	5.38	14.24	82.9	71.1
1849	1,418,072	318,075	5.62	13.10	81.4	68.9
1850	1,540,769	256,988	6.23	14.28	77·8	65.5
1851	1,663,917	279,255	6.46	18.22	75.6	69.8
1852	1,819,744	299,472	6.93	17.18	74.5	66.5
1853	2,013,154	355,356	7.50	19.60	71.5	67.1
1854	2,238,783	424,494	8.18	22.16	71.4	69.3
1855	2,420,091	536,046	8.63	19.72	77.3	73.8
1856	2,401,688	583,450	8.19	22.83	78.1	70.9
1857	2,377,095	469,293	7.83	24.33	71.8	69.2
1858	2,421,715	244,712	7.72	20.27	72.0	75.0
1859	2,414,654	156,602	7.58	22.73	63.7	69.9
1860	2,448,941	214,797	7.58	24.27	63.0	69.7
1861	2,540,020	233,194	7.76	18.19	60.0	72.1
1862.	2,177,153	175,075	6.62	13.28	44.8	54.5
1863	1,892,899	311,045	5.75	17.46	43.3	40.0
1864	1,459,888	415,740	4.35	19.61	24.6	30.0
1865	1,504,575	394,600	4.36	17.36	29.9	26.1
1866	1,294,637	336,146	3.91	28.47	25.1	37.7
1867	1,369,917	305,594	4.18	24.28	28.0	39.1
1868	1,343,793	285,304	4.06	23.02	33.0	36.6
1869	1,353,170	275,230	3.97	23.25	31.3	34.9
1870	1,324,256	276,953	3.76	25.76	33.1	37.7
1871	1,244,228	273,226	3.45	28.70	31.0	32.6
1872	1,232,982	209,052	3.37	30.80	26.8	29.8
1873	1,229,865	359,245	3.33	32.42	27.0	25.7
1874	1,233,678	432,725	3.27	30.88	30.2	24.6
1875	1,362,138	297,638	3.48	28.00	29.3	23.7
1876	1,394,594	203,585	3.46	25.51	30.8	25.4
1877	1,421,061	176,591	3.41	25.95	31.5	23.7
1878	1,458,209	235,503	3.36	25.59	32.2	22.6
1879	1,335,210	193,030	3.00	24.60	31.6	17.6
1880	1,206,206	157,409	2.62	32.21	22.0	13.7
1881	1,182,817	280,458	2.51	32.52	19.9	13.3
1882	1,187,724	282,269	2.38	29.59	19.2	12.8
1883	1,130,190	265,429	2.33	29.51	20.7	13.4
1884	1,120,033	225,514	2.28	27.06	22.4	14.4
1885	1,101,593	159,046	2.20	24.48	21.3	13.7
1886	934,546	95,453	1.81	23.80	20.0	13.6
1887	841,992	150,450	1.63	24.89	18.6	12.2
1888	760,386	218,086	1.48	24.60	18.5	11.7
1889	698,619	234,142	1.57	22.37	17.08	11.62
1890	637,062	------	1.45	25.73	16.6	9.03

U. S. shipping in foreign trade; its growth, thrift, and decline (continued).

Years.	Percentage of U. S. vessels in entries and clearances of the United States. Per cent.	Amt. paid for subsidies.
1848	64	$100,500
1849	59	235,086
1850	56	619,924
1851	59	1,465,818
1852	63	1,655,241
1853	63	1,880,273
1854	66	1,903,286
1855	71	1,936,715
1856	70	1,886,766
1857	72	1,589,153
1858	71	1,211,061
1859	67	1,204,569
1860	66	854,329
1861	66	806,885
1862	63	374,618
1863	55	416,075
1864	40	440,440
1865	42	475,428
1866	38	713,928
1867	41	867,203
1868	44	1,016,146
1869	41	1,101,689
1870	39	1,115,333
1871	37	975,025
1872	33	1,206,891
1873	29	1,044,157
1874	29	988,393
1875	32	976,644
1876	30	953,610
1877	28	448,876
1878	26	199,979
1879	22	200,026
1880	21	199,809
1881	19	240,067
1882	20	200,500
1883	21	316,358
1884	23	327,208
1885	22	331,903
1886	23	357,443
1887	21	425,818
1888	22	647,000
1889		521,338
		$33,947,899

Table showing the growth of British shipping.

Years.	Registered tonnage. Tons.	Tonnage of vessels built. Tons.	Per cent. of Br. vessels in entries and clearances. Per cent.	Amt. paid for subsidies.
1848				$3,250,000
1849	3,096,344			3,108,000
1850	3,137,212		65.1	5,313,985
1851	3,360,935			5,330,000
1852	3,380,884			5,510,635
1853	3,730,087	219,171		5,805,400
1854	3,729,093	214,942		5,950,000
1855	3,990,190	341,200		5,741,633
1856	4,156,077	332,578		5,713,760
1857	4,211,482	268,472		5,133,485
1858	4,325,142	236,554		4,679,415
1859	4,269,109	212,744		4,740,190
1860	4,251,739	225,871	55.3	4,369,760
1861	4,349,695	208,326		4,219,267
1862	4,473,294	261,932		4,562,187
1863	4,795,277	378,307		3,882,175
1864	5,208,468	460,833		4,062,627
1865	5,408,451	448,169		4,367,959
1866	5,452,862	379,539		3,862,534
1867	5,493,708	305,979		3,964,765
1868	5,516,434	362,328		3,801,648
1869	5,573,031	388,092		3,768,920
1870	5,559,110	394,357	68.4	5,125,470
1871	5,633,561	391,058		4,697,695
1872	5,761,608	474,718		5,078,163
1873	5,748,097	453,543		4,499,646
1874	5,864,588	603,867		4,582,746
1875	5,891,692	472,058	67	4,440,563
1876	5,996,152	378,020	66	4,054,091
1877	6,115,638	450,919	67	4,736,908
1878	6,236,120	470,719	68	3,781,275
1879	6,249,883	405,991	71	2,295,216
1880	6,344,577	472,896	71	3,322,040
1881	6,490,943	608,878	72	3,223,407
1882	6,715,030	783,051	71	3,217,313
1883	7,026,062	892,216	72	3,093,693
1884	7,083,944	588,274	72	3,074,313
1885	7,209,163	441,012	72	3,174,984
1886	7,144,097	331,528	73	3,002,242
1887	7,123,754	377,198	73	3,193,274
1888	7,351,888			3,040,040
1889				3,046,037

Table showing the extent of the French foreign trade from 1883–88, in millions of dollars and thousands of tons:

Year.	Imports.	Exports.	Total.	Imports.	Exports.	Total.
1883	$1,177	$912	$2,089	24,770	6,228	30,998
1884	1,048	814	1,892	24,120	6,054	30,174
1885	986	791	1,777	22,316	5,834	28,140
1886	1,023	849	1,872	21,682	6,019	27,651
1887	984	848	1,832	22,462	6,895	29,357
1888	1,037	850	1,887	23,657	7,139	30,796

Tables showing the relative increase and decrease in the tonnage, vessels built and bought, bounties and subsidies paid:

Year.	Total tonnage.	Tonnage of vessels built.	Tonnage of vessels bought abroad.	Totals.
1860	996,124	----	----	----
1870	1,072,048	----	----	----
1875	1,028,228	37,520	20,001	57,521
1879	932,853	24,733	16,809	41,542
1880	919,298	12,629	34,201	46,830
1881	914,373	20,735	34,909	55,644
1882	983,017	56,594	78,612	135,206
1883	1,003,679	35,223	49,387	84,610
1884	1,033,829	57,162	20,472	77,634
1885	1,000,215	15,930	9,681	25,611
1886	993,291	27,075	14,392	41,467
1887	972,525	15,247	14,822	30,069
1889	932,745	----	----	----

Year.	Amt. paid to ship builders.	Premiums on navigation.	Total.
1881	$183,522	$575,312	$758,834
1882	876,335	1,246,512	2,122,847
1883	609,937	1,633,704	2,233,651
1884	865,599	1,657,742	2,523,341
1885	217,927	1,460,435	1,078,362
1886	580,084	1,462,622	2,042,706
1887	281,294	1,586,203	1,867,499

The following is the sailing and steam tonnage of the German merchant marine from January 1, 1871, to 1889:

	Sailing.		Steam.		Total.	
Years.	No.	Tons.	No.	Tons.	No.	Tons.
1871	4,372	900,361	147	81,994	4,519	982,355
1872	4,352	891,660	175	97,030	4,529	988,690
1873	4,311	869,637	216	129,521	4,527	999,158
1874	4,242	866,093	253	167,633	4,495	1,033,725
1875	4,303	873,385	299	189,998	4,602	1,068,383
1876	4,426	901,313	319	183,379	4,805	1,117,935
1877	4,491	922,704	318	180,946	4,809	1,103,650
1878	4,469	934,556	336	183,379	4,805	1,117,935
1879	4,453	949,467	351	179,662	4,804	1,129,129
1880	4,403	947,943	374	196,343	4,777	1,171,286
1881	4,246	965,767	414	215,758	4,660	1,181,555
1882	4,051	942,759	458	251,648	4,509	1,194,407
1883	3,855	915,446	515	311,204	4,370	1,226,650
1884	3,712	894,778	603	374,699	4,315	1,269,477
1885	3,607	880,345	650	413,943	4,257	1,294,288
1886	3,471	861,844	664	420,605	4,135	1,282,449
1887	3,327	830,789	694	453,914	4,021	1,284,703
1888	3,094	769,818	717	470,364	3,811	1,240,182
1889	2,885	731,315	750	502,579	3,635	1,233,394

An annual subsidy of $1,147,619 has been paid to the German Lloyd Co. since 1885.

Total value of exports of merchandise from the United States to the following American countries:

	1881.	1882.	1883.	1884.
Spanish West Indies	$12,710,000	$12,610,000	$16,680,000	$1,275,000
British "	8,140,000	7,820,000	8,240,000	855,000
Other "	8,290,000	7,120,000	7,400,000	635,000
Brazil	9,140,000	9,040,000	9,160,000	865,000
U. S. of Columbia	5,180,000	6,230,000	6,720,000	617,000
Venezuela	2,700,000	2,140,000	2,360,000	239,000
British Australasia	6,640,000	8,980,000	9,640,000	923,000
China	5,450,000	5,900,000	4,080,000	463,000
British North America	35,790,000	35,290,000	42,830,000	4,251,000
	1885.	1886.	1887.	1888.
Spanish West Indies	$10,250,000	$11,700,000	$11,850,000	$1,164,000
British "	6,960,000	7,110,000	6,470,000	745,000
Other "	6,810,000	6,570,000	6,540,000	788,000
Brazil	7,260,000	6,480,000	8,070,000	706,000
U. S. of Columbia	5,400,000	5,290,000	5,970,000	492,000
Venezuela	2,990,000	2,700,000	2,830,000	301,000
British Australasia	10,530,000	10,980,000	9,540,000	1,108,000
China	6,400,000	7,520,000	6,250,000	458,000
British North America	35,980,000	31,960,000	33,490,000	3,443,000

Below is a statement showing the number and tonnage of steam vessels engaged in the trade between countries south of us and the United States, taken from the *New York Commercial Bulletin*, which was published after a careful investigation of the actual lines in the trade:

AMERICAN VESSELS.

	Tonnage.
Pacific Mail	26,026
New York and Cuba Steamship Company	14,927
Clyde West India Line	4,000
Red "D"	9,270
Royal Mail	1,780
Morgan	11,242
Oteri's Pioneer Line (American Steamers)	695
United States and Brazil	8,400
New Orleans and Colombia	1,800
Plant Line	1,625
Total	79,775

FOREIGN VESSELS.

Quebec Steamship Company	4,875
Direct Line to Trinidad	2,870
Red Cross	3,000
Atlantic and West India	1,082
Honduras and Central American	2,013
Booth	7,694
New York and Jamaica	3,000
Atlas	22,600
Winchester & Co.	
Porto Rico	2,000
Brazil, etc.	1,000
Earn Line	3,000
Sloman's Line	5,200
New York and Yucatan	2,290
Oteri's Pioneer Line (foreign vessels)	1,400
New York and Porto Rico	1,600
Tauras	622
Royal Dutch and West India	5,250
Compania Trans. Espanola	9,000
People's Line to Hayti	1,500
Anchor Line, West India route	6,000
Total	85,996

It can not be claimed that it is a lack of communication that has prevented our trade from increasing with these countries. It is a lack of trade rather than lack of transportation. The same paper adds:

"It will be seen that there are thirty lines in the trade, with an approximate tonnage of 165,771, nearly one-half of which is American. Three of the American lines, the Thurber, Ward, and Red D Companies, have nine new vessels, on the stocks or just completed, of about 5,000 aggregate tonnage. In addition there is a large 'tramp' tonnage, not taken into account in the above statement."

Table of the principal merchant navies in 1888:

	Sailing vessels.			Steamers.			Total tonnage by multiplying that of steamers by 3.	
Countries.	No.	Net tonnage.	Rank.	No.	Gross tonnage.	Rank.		Rk.
England & Col.	6180	3,524,000	1	4885	6,873,000	1	25,429,000	1
France	920	245,000	8	490	740,000	2	2,466,000	4
Germany	1292	684,000	4	640	726,000	3	2,862,000	3
United States	3148	1,402,000	2	425	516,000	4	2,951,000	2
Spain	514	139,000	12	380	399,000	5	1,355,000	7
Italy	1461	563,000	5	201	284,000	6	1,416,000	6
Netherlands	390	166,000	10	149	191,000	7	737,000	9
Norway	2929	1,271,000	3	329	185,000	8	1,827,000	5
Sweden	1029	299,000	6	491	163,000	9	799,000	8
Austria	255	127,000	13	125	149,000	10	575,000	11
Denmark	598	119,000	14	196	110,000	11	539,000	12
Russia	997	278,000	7	220	139,000	12	696,000	10
Japan	150	40,000	15	172	134,000	13	444,000	14
Greece	365	219,000	9	84	72,000	14	535,000	13
Turkey	791	153,000	11	84	64,000	15	345,000	15

Article IV.—A STORY FROM THE CYCLADES.

From Tenedos to the near Lesbian shore,
From Lesbos to dark Chios, famed for wine,
From Chios, leap by leap through midnight air,
To the low hills of Samos, south toward Rhodes,
And westward, to the long forsaken homes
Across the Cyclades, from isle to isle,
Shot the red flames that told the fall of Troy.

Nine years had old Menides, weak for war,
Kept the fire on the ever-burning hearth
To light the mighty pile of withering wood
Heaped on Chonaxe's summit, seen afar.
And nine long years his slowly failing eyes
Had watched the sun, the moon, the glowing star,
Rise mocking in the heaven. For one day
When all the world was gathering to arms,
And every heart was maddened for revenge,
A band of noble youths from Ithaca
Bade him build high the pile, with promise vain
That ere the autumn rains should dampen it
The lightning of their wrath should send it fire.
So old Menides, long too weak for war,
Nursing the fire to light the fire, so nursed
The failing fire within his wasting heart,
And found a joy in life.

Two daughters fair,
Fair as the rippling sea around their home
Bright neath the dawning and the evening star,
Watched well the deathless fire that warmed their hearth
After the folding of the well-kept flocks.
For by its kindling faggots two brave youths
Knit hands with theirs in plighted troth, and vowed
"Hymen shall light his torch another year,
By this same fire where Love hath kindled his!"
So the fond maidens, with as jealous care
As the old father, fed the sacred flame,
So cherishing sweet flames within the breast.

And when, at last, before the early dawn,
As custom was, leading their flocks to field,
They saw that sudden signal in the east
Like a faint day-break through once-rifted clouds,
Or like the sun leaving a long eclipse,
How their cheeks caught the glow before the pyre!
And how the brand upon the hearth-stone leapt!
How isle and ocean flushed beneath the blaze
Flung right and left from the liberated flame
Which the dark west caught up and sent beyond.

Then day by day and hour by hour they watched
With ever-sweeter hope the frequent sails
Pass on the far horizon; till at last
One winged swift way toward their lonely isle,
And the brown voyagers disembarked. Alas
For patient, happy hope! No lover came.
But one, their fellow, brought the taller fair
Dread message, this: "Thy lover fell in fight
Bravely, pierced to the life by Hector's spear.
And, plucking from his side this fatal point,
He bade me bring it thee, stained with dear blood
Warmed by his love for thee till chilled in death."
Then old Menides' daughter turned her round,
Grand as a new-crowned goddess in her grief,
To the old father, long too weak for war,
Crying "O father, orphaned of thy son,
Thy daughter hath loved nobly, and shall live
Crowned with the love that death alone could take,
Worthy her sire and lord that would have been;
And henceforth let her live to love but thee."

Then spake the younger sister, "Hast thou not
Some word for me? Tell me my lover lives!"
"Thy lover lives, O beautiful, he lives,
But with a bride from the Idalian shore."
As the chill frost from Pelion on the flowers
In Tempe, fell those blasting words on her;
As die the flowers in Tempe at a breath
Before the sudden frost, so fell she there.

Colorado Springs, Col. ERNEST WHITNEY.

Article V.—PICTORIAL TONE-REACTION.

Tone-reaction is the principle of color law, which, by its presence or absence, makes or mars color success in a picture. It is a quality that represents and describes the continuous inter-play of warm with cold tones: and since warmth of color tone corresponds with sweetness of musical tone, the unfortunate canvas over-loaded with cold tints, *ipso facto*, loses its correct color balance and its sweetness, or in other words—its tone-reaction.

This loss renders impossible true color harmony as well as either luxuriance or intensity of color richness. In fact, without sufficient warmth from vermilion and cadmium, either pure or in countless combination, the very words pictorial color richness lose their meaning: for without the wealth of brilliance supplied by scarlet and orange, all attempts at color splendor fail completely and insuperably. Experience proves that an excess of cold tones must always be meagre, unsatisfactory, and monotonous. Insipidity and dullness with plenty of sadness are sure to pervade such unhappy canvas. But when the picture is otherwise skilfully painted, it may, perhaps, have power to suggest the wailing shriek of winter wind, or it might introduce woe-be-gone melancholy, or reproduce the effect of freezing twilight in a landscape whose theme is some dreary waste, barren, lonely, and desolate.

But this minor key is plainly out of place in portraiture. It cannot aid but must only hamper and hinder portrayal of feminine beauty. And the error appears to be so evident, so axiomatic—that the art student should hardly need caution against surplusage of cold tones in background of portraits! It is, however, positive that warmest flesh tones cannot survive submersion in such a chilling flood. Thus dealt with, the genuine, living glow of admirable flesh is simply extinguished —drowned.

Now all these incontrovertible color facts being as they are, it is not easy to understand why tone-reaction should be

deliberately disregarded by painters having experience enough to know better.

Nor is it even disputed that every landscape is full of atmospheric blue-grey sky reflexions, or that they are both plainly visible and omnipresent. It is also generally understood that blue with red makes purple, and that this blue has unquestioned affinity for red and seeks it. Wherever, therefore, these colors meet, according to location and light, there will be found shadows more or less purple tinted: they will range in varying lights, from decided purple to the faintest tinge of lilac. The omnipresence of these purples, and lilacs or blue-greys is easily explained.

Red has a prominent place and an active part in nature's scheme of color. It often exists where the trained eye alone can recognize it. For instance, every one does not know that the gray rock under foot on a dusty road may be closely imitated with a mixture of green, red, and white, or that red may be combined with blue so as to compose a tone stronger and deeper than the blackest black. The yellow-grey of the country road has also a large share of red in its composition. Therefore, when blue sky reflexions fall upon the top or high-light of the rock on the country road, the blue of the sky combines with the red of the stone color to form pale lilac pictorial atmosphere. Falling upon the rock, this atmosphere softens its high-light outline with a tone at once delicate, and blue-gray slightly tinted with lilac. But in the shadow of the same rock, the blue finds the deeper red of the road color. Uniting with it, there results a more decided purple tinge in nature's ever transparent shadow.

Thus is composed a strong tone, mingled warm and cold, that for fineness of *transparent* texture and power of eye-pleasure is far, very far from the heavy, flat, purple, *opaque* shadow of the impressionist.

Of course, a painter may do as he likes with his own and he has the unquestioned right to look at nature with lilac eyes and to parody her beauty with as many shades of purple as he choses. But while he is free to do all this without let or hindrance, in doing so he may not expect—as he cannot obtain—the success of a colorist. And it should be remembered that before the arrival of the impressionist with his lilacs, stern color

law, with its tone-reaction, had long been despotic—the law of gravity is not more inflexible—and also that it will continue to govern the artistic use of color after the ephemeral craze for purple and lilac is no longer remembered.

In despising tone-reaction and in studying nature through purple spectacles, impressionists profess to have better and clearer sight than other painters. They also claim to have discovered novel excellence in a venerable and wholly illogical color extravagance. Only at this late day are their eyes partially opened to the essential fact of atmosphere everywhere. Later, when they have learned to see more correctly, they will understand that nature's beauty as well as genuine pictorial atmosphere cannot be truthfully represented by tiresome monotony in purple and lilac. And they may also learn that only while strictly obedient to the law of color tone-reaction, does lilac or blue-gray pictorial atmosphere become the very breath of life to the painter's art.

F. WAYLAND FELLOWES.

Article VI.—LIGHTNING ARRESTERS.

In writing on this topic I shall not presume to enter into the theory of induced charges from lightning strokes. This branch of the subject has been beautifully and clearly enunciated by the masters, and particularly, I think, by Professor Lodge. In this Article I shall confine myself chiefly to some of my own practical experiences, and thus, in stating facts, found in practice, shall hope to interest the reader.

The "setting sun," the "electric current," and other such expressions, appeal readily to the mind and for that reason are useful in daily intercourse. But from a scientific standpoint they fail to explain or even state facts. A "lightning arrester" is an expression somewhat similar to the above.

Electric wires are seldom struck by lightning. During a thunder storm they invariably become charged with more or less static electricity. This static charge, being as it is, of a different potential from that of the earth, there is a tendency to equilibrium. A lightning stroke in the neighborhood of such a wire will suddenly and greatly increase the charge and thus cause a corresponding increase in the difference of potential already existing between the wire and the earth. The existing state of affairs is then—a wire insulated from the ground and charged with static electricity differing in potential from that of the earth. To illustrate with more commonplace objects: suppose a weight on the top of a post, the weight is then said to be at a different potential from that of the earth and there is a tendency to equilibrium; that is, the weight tends to reach the earth and the earth tends to reach the weight, the post hinders an equilibrium. In the illustration the weight corresponds to the static charge on the wire, the post to the insulation between the wire and the earth. The earth is the common reservoir where equilibrium is found in either case. If the post is weak in proportion to the weight it is supporting there may be a gradual or sudden giving away—and the weight will fall to the ground. It might be that the post could readily support the

weight undisturbed, but that it would crumble if the weight were suddenly shaken or violently struck. With the electric wire the case is analogous; the static charge tends to reach the ground, but is hindered by insulation such as the covering on the wire and the air between wire and earth. It may be that this insulation is sufficient for all ordinary purposes, but when a stroke of lightning superinduces an extra static charge in the wire, the pressure, that is, tendency for the charge to reach the earth becomes so great that ordinary insulation is apt to give way and mischief will surely follow, as will be seen later, unless necessary precautions are taken.

In order to rid the line of a static charge an outlet or safety valve, so to speak, is provided, which consists of two small brass plates, having each a saw-tooth edge. These plates are adjusted with their respective teeth opposite each other and about one thirty-second of an inch apart, one plate being connected to the line and the other to the ground. If now the line becomes highly charged, a discharge will take place from line to earth across the air space—and this will occur whenever the pressure of the static charge on the line becomes sufficient to break down the insulation between the saw-tooth points. If the insulation resistance of the line is everywhere greater than at the discharge points, then the line will always unburden itself at the proper place and its insulation be saved from rupture. If such a safety valve were not provided, the discharge would be left to choose its own path, and this it would find at the weakest and nearest point to earth—usually the most vital one in any electric system. The above simple device is called a "lightning arrester" and may be seen on any properly constructed telephone or telegraph system, where it offers ample protection from excessive static charges on the line. But with electric light wires the case becomes very different, and in fact each different system of electric distribution of light and power demands some special device, according to circumstances, as regards this matter of safe conduction to earth of the static charge.

In Fig. 1 let d represent a source of electric current generated at a pressure of one or two hundred volts. Let H, H' be the line or circuit, A any electric apparatus and a, b, c a lightning arrester as above described, only in this case the arrester

is double, thus forming a protection for both poles of the generator. Plate *b*, being common to both sides of the arrester is made of one piece and connected to earth at *G*. Now, if a charge should be suddenly induced in the line *H'* and if the line be in good order, the charge will break down the insulation between *c* and *b* and a safe discharge will be made to ground. But suppose there should be a weak point in the line, say at *x*, such that the path from line to earth would be easier there than across the air space in the arrester, then the discharge would take place at *x*—the insulation would be punctured and the apparatus ruined. This, however, would only occur

FIG. 1.

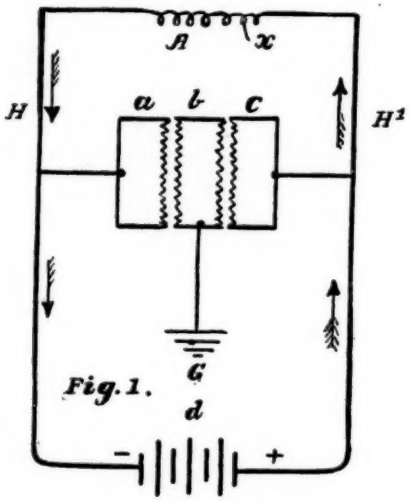


Fig. 1.

through faulty construction. The greatest trouble with lightning arresters is this. Suppose two separate charges to be induced, one on *H*, the other on *H'* at the same time, then the two discharges to ground through the arrester would also take place at the same time, and for an instant the two spaces between *c* and *b* and *b* and *a* would be bridged by a flash of the discharge, and as this flash is a comparatively good conductor of electricity, the dynamo current would take advantage of the opportunity and rush from the line *H'* to *c*, to *b*, to *a* and to *H*,

and thus form a short circuit on the generator. Those who are familiar with dynamos will readily appreciate what this expression, "short circuit," means. The uninitiated will gain a faint idea if I liken a short circuit to the bursting of a dam. Under ordinary circumstances the current, impelled by its electromotive-force, is held in check by the resistance of apparatus and insulation (dam) in circuit. But if this resistance is removed or the current takes a short cut as above represented, the flow will be enormous and limited only by the capacity of the generator and the engine driving it. The usual consequences of such a short circuit are a vaporized arrester, a charred insulation on the line and probably a ruined dynamo. We have in the above case assumed the moderate pressure of one or two hundred volts, but when the pressure is one or two thousand volts, the difficulties become more serious. Up to within a recent date the consequent short circuit has been interrupted through the medium of a lead fuse placed in the circuit between c and H' or a and H. Any abnormal flow of current would then instantly melt the fuse and break the continuity of the short circuit. This combination answers very well for the first discharge and consequent short circuit. But when the fuse is once melted, who is going to replace it while there is a thunder cloud hanging over the wires? Even suppose that the fuse could be successfully and easily replaced, in the meantime another discharge might occur and punch through the armature insulation, and so, in an instant, ruin many hundred dollars worth of property. In a heavy thunder storm these discharges take place constantly, often within a second or two of each other. A good lightning arrester should form the easiest path from line to ground. It should instantly break the short circuit consequent on the simultaneous discharge from both lines and as quickly readjust itself for a fresh discharge. It should be simple, strong, non-combustible and strictly automatic. And finally, it should not depend for its action on an electro-magnetic device. For example, an electro-magnet might be so connected in the circuit between c and H' that upon the passage of a current, plate c would be instantly moved away from b a sufficient distance to rupture the circuit. A convenient spring would cause plate c to again take its normal position. Such arresters

have been made but have given only limited satisfaction. For circuits carrying a high electro-motive force they would be utterly inadequate, as the plates would have to be separated from one to three feet before the arc would "let go." The fact of an electro-magnet being in the circuit is objectionable because a static discharge is not as readily guided in its direction as is the ordinary dynamo current, that is, the discharge, rather than whirl through the coils of an electro-magnet, will often jump from one convolution to the other, or perhaps the discharge will find some other point in the line offering less resistance to its passage than the coils of the arrester. However, such a coil in series with an arrester is not necessarily fatal to its successful action. Much would depend on the construction of the coil, the insulation of the line, and the character of the discharge. But it is very certain that the coil does diminish the working margin of the arrester—that is, the difference in the resistance to ground through the arrester and through the weakest point on the line is not so great with the electro-magnetic device in the arrester as without it.

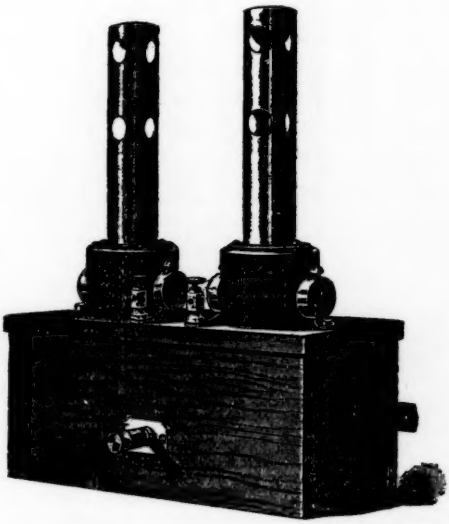
If a simple inductive resistance be properly applied it can be of great assistance to a lightning arrester. Professor Lodge has taken advantage of this property of induction and constructed an arrester having discharge plates as above explained, with the addition of an induction coil placed between the generator and the point of contact of the arrester with the line. This coil simply serves to increase the working margin of the arrester by increasing the resistance to a discharge through the dynamo. This arrester, however, is very limited in its use and does not provide a means for opening the consequent short circuit. I presume it is only intended for use on telegraph circuits and the like.

The Thomson-Houston arrester is a simple device. In it the discharge points are so adjusted in relation to an electro-magnet through the coils of which the abnormal current must flow, that the arc, formed by the consequent short circuit, is extinguished. This action is due to the well-known fact that it is difficult to maintain an arc in a strong magnetic field. The arrester is, however, open to the objection cited above, namely, that it has an electro-magnetic device in its circuit, which

diminishes its working margin. On the other hand, it has the advantage of simplicity with freedom from moving parts.

About two years ago the writer became interested in this subject in behalf of the Washington Electric Co., and determined to see if he could not improve on the "old saw-tooth," as it is now called, for this is all the company had at that time to protect its lines from static discharges. After a good deal of exploiting, he finally succeeded in designing an arrester which has proved eminently successful and forms a radical departure from all other methods devised heretofore. The greatest difficulties he had to contend with were the high pressure of 1,000 volts used on this company's lines, and the small self-induction in their armatures. The consequence of this combination was an enormous arc every time that a machine was short circuited. In the accompanying cuts, Fig. 2 shows the

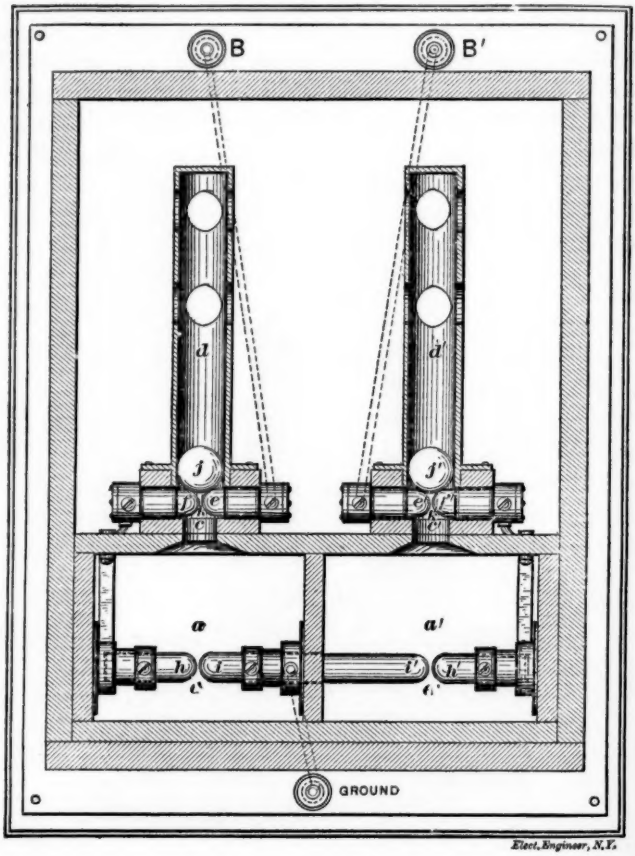
FIG. 2.



present style of the arrester in perspective. Fig. 3 shows the original form partly in section—the details and action are the same in either case, and will be readily understood from the following: a and a' are air chambers separated by a partition.

From each air chamber there is a slotted passage c and c' leading into the tubes d and d', the tops of which are provided with rubber bumpers (not shown in the cut). $e\ e'$, $f\ f'$, $h\ h'$, $i\ i'$, are ordinary arc light carbons, and $j\ j'$ are carbon balls, bridging over the air spaces $k\ k'$. Each pole of the dynamo

FIG. 3.



has a connection $B\ B'$ to the ground from its respective binding post on the arrester through e or e', j or j', f or f', h or h', the jumping space l or l', and thence by i or i' to the ground binding post. The action which takes place, when a discharge to

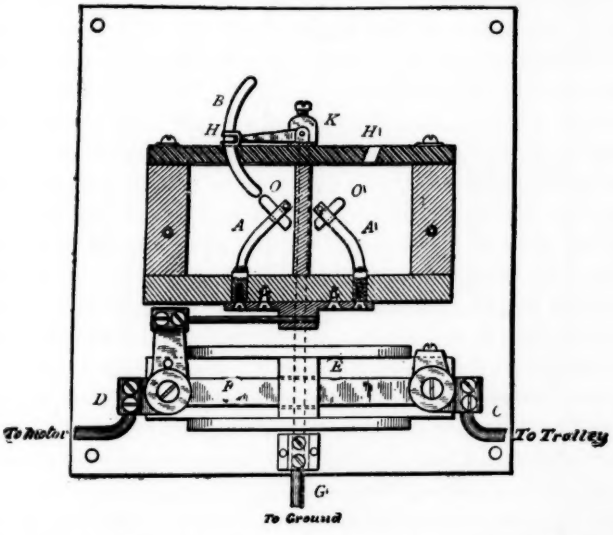
ground is made with a resulting short circuit, is as follows: The arc formed at either or both of the jumping spaces *l l'* instantly heats and expands the air in the respective air chamber, which, rushing up through the slotted passage *c* or *c'*, blows either or both carbon balls to the tops of the tubes. The arc formed where the circuit has been broken by the projected carbon ball is at the same time instantly blown out, thus completely rupturing the circuit. The only demonstration is a quick puff as the air rushes out of the holes near the upper ends of the tubes. The object of the holes is obvious. As the balls are confined in the tubes, they at once drop back to their former positions and thus automatically place the apparatus in a condition ready for another discharge and short circuit. In testing this arrester the terminals *B B'* are connected to the circuit of a 1,000 volt generator. The air spaces *l l'* are bridged over with a fine wire to take the place of an actual discharge. Then, by the throw of a switch, the full pressure of the machine is placed on the arrester. There is an enormous rush of current, the temporary wire bridges fuse, arcs are formed, the air expands with an explosion, the balls fly up, more arcs are formed, tongues of fire shoot out of the holes in the tubes, the upper arcs are blown out, the balls drop back to their normal positions, and all this happens like a pistol shot, without so much as causing a flicker in the lamps. It is very curious to notice that if this short circuit is made on the crest of a wave of an alternating current the report of the explosion is much sharper and louder than when the circuit is closed at the instant the wave is at or near the neutral point. This action is quite marked, even when the alternations are seventeen or eighteen thousand per minute. I might add here that after short circuiting a 1,000 volt, 3,000 light machine through such an arrester about four hundred times there was not the slightest deterioration to be noticed anywhere. Those who are not familiar with this kind of work will hardly appreciate this last fact or realize what is accomplished each time the arrester "goes off." I must confess that for a long time I was unable to exhibit the arrester by a practical test without having a violent fit of "buck fever," so tremendous are the conditions, namely, a 1,000 volt circuit backed by a 300 H. P. engine and

the fact that all this energy has to be let loose, so to speak, in the arrester, and then instantaneously checked in its action. But the "buck fever" was due more to the possible results in case of failure than anything else. Before exhibiting I always had the pleasant certainty before me that either the arrester would work perfectly or that the entire instrument, metal and all, would be instantly volatilized in a "howling" ball of fire, that the dynamo would roar, so that it could be heard two blocks away, and finally, that the dynamo armature would more than likely give way. In my varied experience in this line of work I have had some exciting times, but am pleased to say that with two exceptions this form of the arrester has never failed on pressures up to 1,500 volts.

When called upon to design an arrester for three and four thousand volt circuits, I felt doubtful as to whether the blast of air in this arrester was applied with sufficient advantage to blow out the arcs that would be formed; for from these circuits arcs two and three feet in length can be drawn. One test settled the question by promptly burning up the arrester and doing some other small damage. But being convinced that this same general principle could be successfully applied to any type of arrester, the writer again began experimenting and finally produced the following arrester, which has now been adopted by this company for use on very high voltages and for their street car lines. It consists of two air chambers, A and A', fig. 4, having vents, shown at H and H', through which the curved carbon B hinged at K, can freely pass, swinging from O to O'. The carbon point O is so adjusted as to be separated from B, when in its normal position, as shown in the figure, by one-sixteenth of an inch. The distance from O' to B is likewise one-sixteenth of an inch, when the curved carbon is in the other chamber. Carbon B is connected to ground at G, and carbons O and O' to the line at D. F is a lead fuse, and E an insulating block, provided with a slot, through which the lead fuse must pass. The points C and D are connected in series with the motor or other apparatus. The action is as follows: When a discharge takes place, it passes through the lead fuse F, to one of the carbons, O or O', depending upon the position of B; then across the air space to the curved carbon B, and

from there to the ground, as shown in the figure. The dynamo current then following causes an arc to be established between carbon *B* and *O* or *O'*. The heat generated by this arc expands the air in its respective chamber, increasing the air pressure therein, and causes carbon *B* to be instantly blown from one chamber to the other. This ruptures the arc and adjusts the arrester for the next discharge. In testing this arrester 500 volt and 1,000 volt generators have been repeatedly short circuited through it, and in every case the circuit has been instantly broken without injury to the dynamo, and the arrester has as quickly reset itself in readiness for future use. In one

FIG. 4.



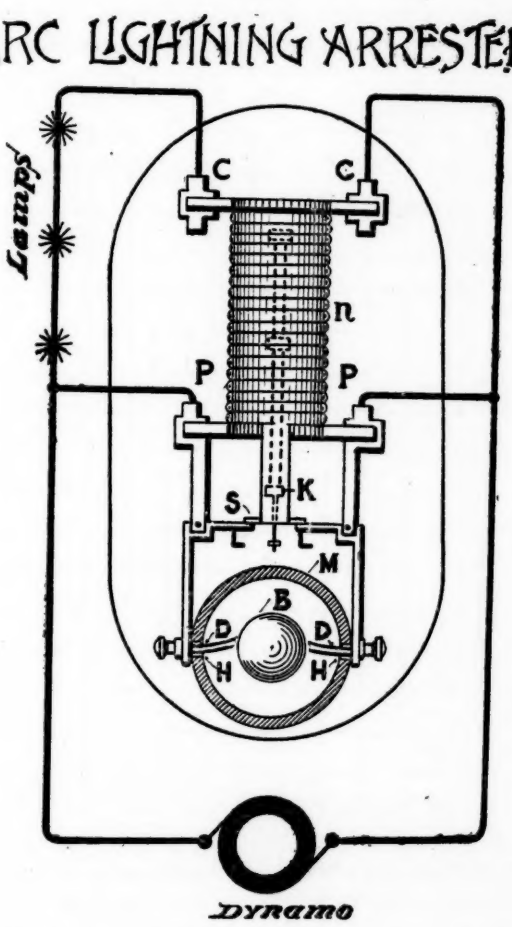
of the tests made to demonstrate its promptness and reliability, carbons *O* and *O'* were so adjusted as to touch carbon *B* in either of its too normal positions. A 1,000 volt generator was then short circuited through the arrester, which resulted in the circuit being several times automatically opened and closed in one second without injury to either dynamo or arrester. For 500 volts the arm holding *B* is made two and a half inches long and for 3,000 and 4,000 volts it is four inches long. It was found that if a shorter arm than four inches were used on high volt-

ages the short circuit would sometimes hold on, and in a very curious way too. I examined the flash and arc through blue glass and found that with a street car arrester a vertical stream of fire about eight inches long was shot up through the hole, and then, making a sharp angle, the current would dart in a perfectly straight line to the end of the curved carbon. It will be noticed what an enormous advantage this type of arrester has over the former, in that, in this one there is a combination of a blast of air and a wide break. It has, however, the disadvantage of being single pole; that is, there would be two of these required where one of the others would do the same work on a lower voltage. Of course on trolley lines this disadvantage does not appear, for there being only one line to be protected a single pole arrester is all that is needed.

When our arc system was brought out, the writer was again called upon to design an arrester for use on these circuits. In the above cases it must be understood that there was always plenty of current to produce the needed expansion of air—in other words, the generators were all constant potential machines; but an arc circuit has a constant current, and a small one at that, about 10 or 20 amperes. So that when I undertook to develop a lightning arrester for such circuits I was at a loss at first for a means of blowing out the arc as heretofore. After some thought on the subject, it finally struck me that the heating effect, being due to the square of the current into the resistance, sufficient heat might be generated, could I but increase the resistance of the arc. So, following out this line of thought, an arrester was developed as seen in the accompanying diagram, fig. 5. *N* is a solenoid connected in the main circuit at *c* and *c*, that is, it is in series with the lamps. Either pole of the dynamo has direct communication with the ground through *P*, *O*, *D*, and thence across the air space to the carbon ball *B* which is fixed and grounded. *M* is a cylindrical air chamber made of porcelain. *D D* are carbon discharge points, swinging freely through the holes *H H* on *O O* as centers. *L O D* forms one rigid piece. *K* is an iron core which is drawn up into the solenoid when the lamps are burning. *S* is a flat spring, intended to hold the core *K* off the arms *L L* when the machine is not running. The action is as follows: Under normal run-

ning conditions, core K is held up in the solenoid, but if a discharge should occur from both sides at once, short circuiting the machine through the discharge points $D\ D$, the solenoid

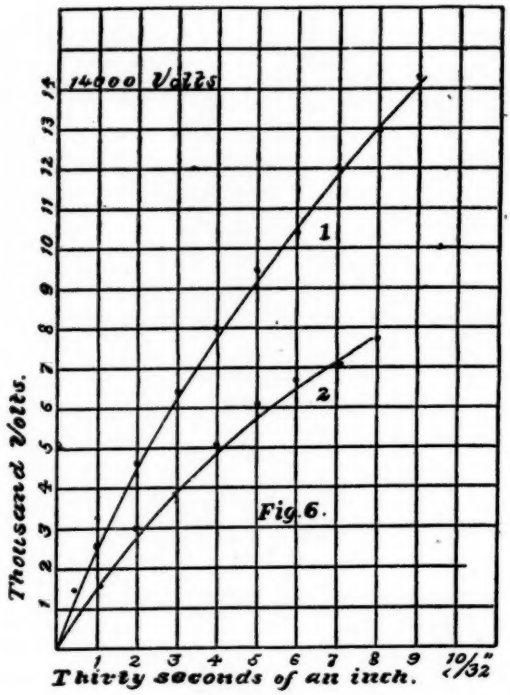
FIG. 5.



would at once lose its power, core K would fall upon the spring S, and this in turn would force the arms $L\ L$ down and the discharge points out through the holes $H\ H$. This action

would draw out arcs three inches long, through the holes *H H* and between the discharge points and the ball *B*. The heat thus generated is sufficient to cause a sudden expansion of air in the air chamber and thus blow out the arc through the holes, even though the current be but 10 amperes and the pressure 3,000 volts. Without the device just described for lengthening the arc, the heat developed would have been that due to the

FIG. 6.



square of 10 amperes times the resistance of the arc in the air space, which is about one-sixteenth of an inch long; whereas with the lengthened arc the heating effect is increased by the greatly increased resistance. In short circuiting a 50 light machine through this arrester, there is a scarcely perceptible flicker in the lamps. Core *K* drops, the short circuit is opened

and the core drawn back into its normal position, ready for further action all in about one-third of a second. Although I have been forced to use an electro-magnetic device in the construction of this type of arrester, it will be noticed that the placing of the coil in the lightning arrester curcuit has been avoided; so that even though every discharge has to pass through this coil to reach the discharge points, yet from this point on, the discharge has a non-inductive path to earth through the arrester in preference to the dynamo.

ALEXANDER JAY WURTS.

NOTE.—Since writing this Article I have been able to determine the electro-motive force necessary to strike an arc across a given air space. The results are plotted in fig. 6. Curve 1 was obtained with an alternator, having a smooth armature running at 16,000 alternations per minute. Curve 2 was obtained with a toothed armature. The difference between the two curves is due to the difference in the wave form of the electro-motive force generated in each case. The discharge points used were of carbon, the same as those used in the arresters. For each point on the curves the air space was adjusted to a certain length and the E. M. F. then raised until an arc was struck. The E.M.F. was measured on a Cardew voltmeter. The object of this test was to determine the shortest air space, consistent with safety, that might be used in a lightning arrester working under given conditions. (See London Electrician, vol. xxvi., No. 667.)

CURRENT LITERATURE.

FERGUSON'S "PHILOSOPHY OF CIVILIZATION."*—The name of Ferguson as a writer on civilization reminds us of another Ferguson who more than a century ago led the way into that attractive field of study. One is Dutch and the other Scotch, but the two Fergusons have more in common than a name and a subject; for, though born in Holland, the later writer comes of Scotch ancestry.

How he is related to Adam Ferguson the friend of Hume and Adam Smith we are unable to say, but we might have conjectured that in taking up this task he was completing the work of a grandfather, were it not for the fact that he nowhere refers to his illustrious namesake, and appears not to be aware of his existence.

Whatever inherited aptitude he may have brought to the treatment of his subject, it is obvious that he was led to the choice of it as corollary to a work of greater magnitude. His first essay in the field of authorship was a discourse on the "Red Cross at Sea"—in which he endeavors to show how the humane provisions of the Geneva Convention may best be applied to the mitigation of the horrors of naval warfare. This grew out of his experience as a captain in the Netherland's navy.

After occupying for some years the post of governor in one of the West India Islands, he was sent in 1873 to represent his government at the Court of Peking, a position which he has continued to fill for nearly a score of years. A diplomatic life necessarily directed his attention to the rules that govern the intercourse of nations, and his long tenure of office afforded him ample time to elaborate his researches in the form of a book—the result being a work on international law which is worthy of a countryman of Grotius. Not to speak of its other merits this work may be safely pronounced the best guide extant for the use of consuls.

International law is the outcome of Christian civilization; and his study of the subject in connection with his experience of a

* *The Philosophy of Civilization.* By JAN HELENUS FERGUSON. London, 1890. Whittingham & Co., 91 Gracechurch street.

civilization not of the Christian type led Mr. Ferguson to embody in another treatise his views as to the principles of human progress.

Like Adam Ferguson he is a pronounced Christian—viewing in the Christian ideal the goal towards which the drift of humanity is tending. Yet there is a marked contrast in the manner in which the subject is treated by the two writers. The former is a historian, the latter a philosopher. One gives us a narrative of facts, the other sets forth his deductions from the principles of science.

The principles with which he sets out would have startled his old-world predecessor, for Helenus Ferguson is a thoroughgoing Darwinian, plus the faith of a Christian. He quotes other writers on civilization, such as Guizot, Buckle, and Draper, no more than he does his ancient kinsman ; but reference to Spencer, Wallace, Darwin, and other writers of the evolution school, occur on every page—the first of the latter two being evidently his *Magnus Apollo.*

He is not, however, held in bondage by authority, as is evident from the freedom with which he criticises Darwin's denial of design in nature (p. 209–213). The closing sentences of that passage may here be cited as showing in few words the mental attitude of the author.

"This ever-present power, balancing energies and motions into obedience to immutable law, displays the growing energy of organic evolution to reach its final object—the moral-mental constitution of man—and all by that astonishing self-adjusting design primordially and potentially enclosed in a globule of water, manifesting itself in every seed, spore or ovum, giving origin to innumerable species—through age on age moving in stately march from lower to higher in the evolution scale of the universe. But whence and whither? The answer to both questions is GOD."

"The great naturalist," he elsewhere says, "was so absorbed in the details of the by-paths of creation, that his mind had no conception of the main track of evolution, which embraces the whole universe—mental and moral, as well as material."

Of Christ he says : "It might be possible to reach by scientific induction a conception of the nature of Christ as such when on earth. Indeed, if the history of mankind did not already possess that ever-living example, philosophy if consistent in its search for the goal of the development theory, for the final link which unites

man in his highest development with his Creator, would postulate such a being as this final link—as the utmost result of evolution."

Having chosen to write in English as the leading language of the world, Mr. Ferguson's style is somewhat deficient in grace. His thoughts, however, are fresh and forcible; and any one who will take the trouble to get at them will find himself amply repaid.

W. A. P. MARTIN.

SIMCOX ON THE WRITERS OF THE NEW TESTAMENT.*—This little volume is designated as Part II. of the author's work on the Language of the New Testament, the first volume of which was recently noticed in this REVIEW (March, 1891). That volume was general and treated of the dialect which all the New Testament writers in common employ; this one is special and deals with the peculiarities of each individual writer and with comparisons of the various authors with one another. In seven chapters the style of the various writers is illustrated; then follow two Appendices in which affinities of vocabulary are shown among the New Testament authors and between them and other writers of post-classical Greek, such as Polybius, Philo, and Apocryphal writers.

Mr. Simcox has limited his work to the sphere of linguistics in the preparation of this manual. He has not discussed the bearing of the facts concerning language and style which he presents upon questions of authorship and genuineness. The differences between the style of Hebrews and that of the Pauline epistles are recognized, but with little more than a hint of the non-Pauline authorship of Hebrews. The grammatical peculiarities of the Apocalypse are exhibited, but their bearing upon the problem of its authorship is not indicated. So far as appears, the Johannean authorship is assumed. The Pauline epistles are treated together, but with a recognition, at the close, of differences of style among them. One author holds the genuineness of the whole thirteen. The proof-reading has not been done with sufficient care. Without directing special attention to the detection of typographical errors a considerable number of them have been observed.

GEORGE B. STEVENS.

* *The Writers of the New Testament, their Style and Characteristics.* By the late Rev. WILLIAM HENRY SIMCOX, M.A. New York: Thomas Whittaker. Pp. 190. 75 cents net.